

SAFETY.CAT.COM™

MAINTENANCE INTERVALS

Operation and Maintenance
Manual Excerpt

Operation and Maintenance Manual

M318 and M320 Excavators

6WL1-Up (Machine)
8AL1-Up (Machine)
6ES1-Up (Machine)
8SS1-Up (Machine)
9PS1-Up (Machine)

i01462222

Maintenance Interval Schedule

SMCS Code: 7000

Note: All safety information, warnings, and instructions must be read and understood before you perform any operation or any maintenance procedure.

Before each consecutive interval is performed, all of the maintenance requirements from the previous interval must also be performed.

When Required

Battery - Recycle	152
Battery, Battery Cable or Battery Disconnect Switch - Replace	153
Bucket Tips - Inspect/Replace	159
Cab Air Filter - Clean/Replace	161
Drum Brakes - Inspect	169
Engine Air Filter Primary Element - Clean/Replace	169
Engine Air Filter Secondary Element - Replace ..	171
Ether Starting Aid Cylinder - Replace	179
Fuel System Priming Pump - Operate	183
Fuel System Priming Pump - Operate	183
Fuel System Priming Pump - Operate	184
Fuses - Replace	192
Oil Filter - Inspect	200
Refueling Pump Strainer - Clean	202
Windows - Clean	211
Window Washer Reservoir - Fill	211
Window Wiper - Inspect/Replace	212

Every 10 Service Hours or Daily for First 100 Hours

Boom and Stick Linkage - Lubricate	154
Boom and Stick Linkage - Lubricate	155
Boom, Stick and Bucket Linkage - Lubricate	156
Boom, Stick and Bucket Linkage - Lubricate	156

Every 10 Service Hours or Daily

Brakes, Indicators and Gauges - Test	157
Cooling System Level - Check	166
Engine Oil Level - Check	173
Engine Oil Level - Check	175
Fuel System Water Separator - Drain	189
Fuel Tank Water and Sediment - Drain	191
Hydraulic System Oil Level - Check	199
Radiator Core - Clean	201
Seat Belt - Inspect	203
Travel Alarm - Test	207
Walk-Around Inspection	210

Every 10 Service Hours or Daily for Machines Used in Severe Applications

Boom and Stick Linkage - Lubricate	154
Boom and Stick Linkage - Lubricate	155
Boom, Stick and Bucket Linkage - Lubricate	156
Boom, Stick and Bucket Linkage - Lubricate	156

Every 50 Service Hours

Boom and Stick Linkage - Lubricate	155
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Every 50 Service Hours or Weekly

Boom and Stick Linkage - Lubricate	154
Boom, Stick and Bucket Linkage - Lubricate	156
Boom, Stick and Bucket Linkage - Lubricate	156
Drive Shaft Universal Joint - Lubricate	168
Tire Inflation - Check	206
Wheel Nut Torque - Check	211

Every 100 Service Hours or 2 Weeks

Axle Oscillation Bearings - Lubricate	152
Blade Linkage - Lubricate	153
Stabilizer Bearings - Lubricate	203

Every 250 Service Hours or Monthly

Air Conditioner - Test	149
Axle Bearings (Front) - Lubricate	150
Axle Oil Level (Front) - Check	151
Axle Oil Level (Rear) - Check	152
Braking System - Test	158
Condenser (Refrigerant) - Clean	162
Engine Oil and Filter - Change	176
Engine Oil and Filter - Change	177
Final Drive Oil Level - Check	180
Fuel System Secondary Filter - Replace	185
Fuel System Secondary Filter Number One - Replace	186
Swing Bearing - Lubricate	203
Transmission Oil Level - Check	207
V-Belts - Inspect/Adjust/Replace	208

Initial 500 Service Hours

Axle Oil (Front) - Change	150
Axle Oil (Rear) - Change	151
Final Drive Oil - Change	180
Transmission Oil - Change	207

Every 500 Service Hours or 3 Months

Cab Riser (Adjustable) Linkage - Lubricate	161
Drive Shaft Support Bearing Lubricant - Check ..	168
Fuel System Primary Filter - Clean/Replace	181
Fuel System Water Separator Element - Replace	182
Fuel System Secondary Filter Number Two - Replace	188
Fuel Tank Cap and Strainer - Clean	190

Every 1000 Service Hours or 6 Months

Axle Oil (Front) - Change	150
Axle Oil (Rear) - Change	151
Battery Hold-Down - Tighten	153
Drum Brakes - Inspect	169
Engine Crankcase Breather Valve - Replace	172
Final Drive Oil - Change	180
Overhead Guard - Inspect	201
Transmission Oil - Change	207

Every 2000 Service Hours or 1 Year

Cooling System Water Temperature Regulator - Replace	167
Engine Governor Oil Supply Screen - Clean/Inspect/Replace	173
Hydraulic System Oil - Change	195
Hydraulic System Oil Filter - Clean	197
Hydraulic System Oil Filter - Replace	197
Hydraulic System Oil Filter - Replace	198
Hydraulic System Oil Filter - Replace	198
Swing Gear - Lubricate	204

Every 2000 Service Hours or 1 Year

Engine Valve Lash and Fuel Injector Timing - Check	179
Hydraulic System Oil Filter - Replace	199
Swing Gear - Lubricate	205

Every 3 Years

Seat Belt - Replace	203
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Every 3000 Service Hours or 3 Years

Cooling System Coolant Extender (ELC) - Add ..	165
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Every 6000 Service Hours or 6 Years

Cooling System Coolant (ELC) - Change	163
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i00679706

Air Conditioner - Test (If Equipped)

SMCS Code: 7320-081

WARNING

Inhaling air conditioner refrigerant gas through a lit cigarette or other smoking method or inhaling fumes released from a flame contacting air conditioner refrigerant gas can cause bodily harm or death. Do not smoke when servicing air conditioners or wherever refrigerant gas may be present.

WARNING

Bodily injury can occur from unexpected contact with open cab doors on machines equipped with a fixed cab riser.

To avoid injury, close the cab door before climbing onto the rear of the machine.

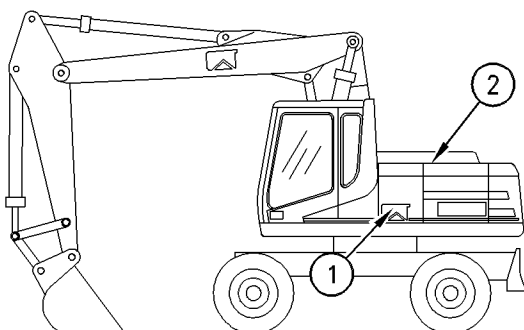


Illustration 261

g00290119

(1) Access door. (2) Top access cover.

1. Open access door (1) on the left side of the machine. Secure the access door.
2. Open access cover (2).
3. Start the engine. Turn the engine speed dial to the medium speed position.

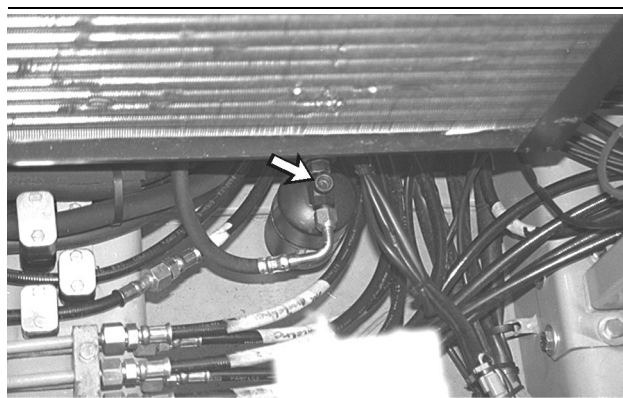


Illustration 262

g00101966

4. Look at the sight glass on the receiver-dryer and note the amount of refrigerant.

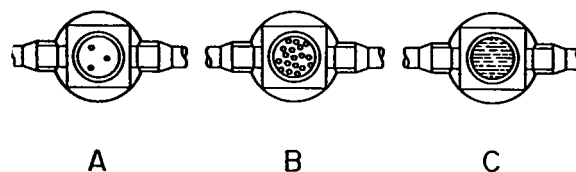


Illustration 263

g00101967

- Sight glass (A) contains only a few bubbles. This indicates that there is a satisfactory amount of refrigerant.
- In sight glass (B), many bubbles are present. This indicates that there is a lack of refrigerant.
- In sight glass (C), small amounts of vapor are present. This indicates that there is almost no refrigerant.

If the condition in sight glass (B) or in sight glass (C) is noticed, consult your authorized Caterpillar dealer for recharging.

Operation of the air conditioner without correct amounts of refrigerant could cause failure of the compressor.

The air conditioner should be kept ready for operation year-round. Operate the air conditioner for a few minutes during the week in order to rotate the compressor. This prevents the leakage of refrigerant. The leakage is caused by a dry seal on the compressor.

i00060139

Axle Bearings (Front) - Lubricate

SMCS Code: 3278-086

The front axle is the axle which steers the machine.
The rear axle is the one with the gearbox.

Wipe all grease fittings before you apply grease.

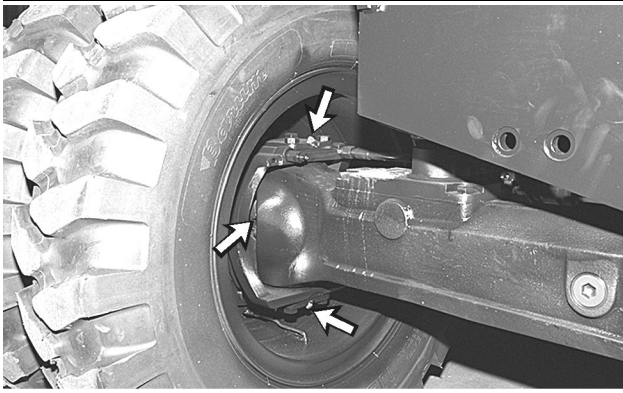


Illustration 264

g00102403

The fittings are behind the front tires.

A grease fitting is positioned on the top of the steering axle. Another grease fitting is positioned on the bottom of the steering axle. Apply grease to these fittings at each end of the steering axle.

For access to the U-joints, fully turn the wheels to the left or to the right. The machine wheels may require rotation in order to access the grease fittings.

i00310408

Axle Oil (Front) - Change

SMCS Code: 3278-044

The front axle is the axle which steers the machine.
The rear axle is the one with the gearbox.

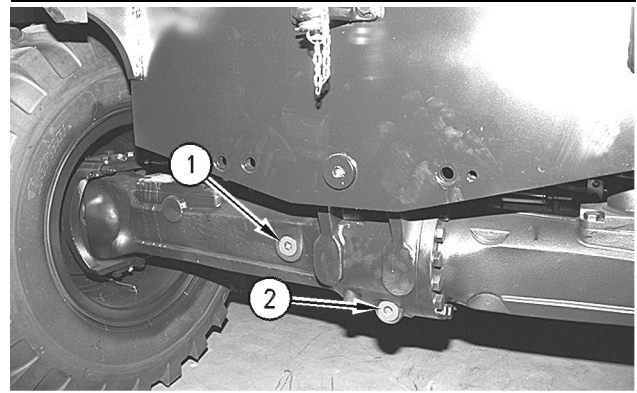


Illustration 265

g00242127

(1) Filler Plug. (2) Drain Plug.

1. Remove the dirt that is around filler plug (1) and around drain plug (2).

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" for information in containing fluid spillage.

2. Remove drain plug (2). Allow the lubricant to drain into a suitable container.

Note: Dispose of drained fluids according to local regulations.

3. Clean drain plug (2).

4. Inspect the O-ring seal. If damage or wear is found, replace the O-ring seal.

5. Install drain plug (2).

6. Remove filler plug (1).

7. Add lubricant through the filler plug opening. Maintain the lubricant level to the bottom of the filler plug opening. Refer to Operation and Maintenance Manual, "Refill Capacities".

8. Clean filler plug (1).

9. Inspect the O-ring seal. If damage or wear is noticed on the O-ring seal, replace the seal.

10. Install filler plug (1).

i01011566

Axle Oil (Rear) - Change

SMCS Code: 3278-044

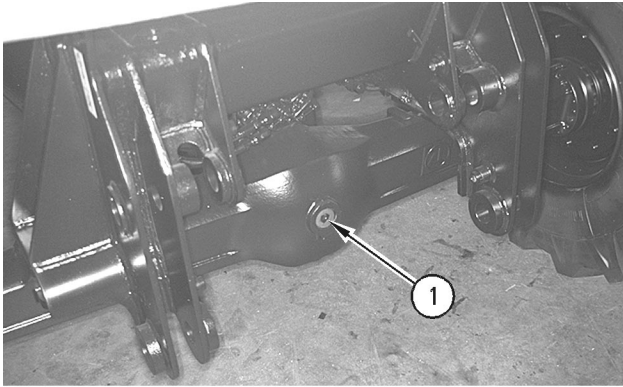


Illustration 266

g00102672

(1) Filler plug

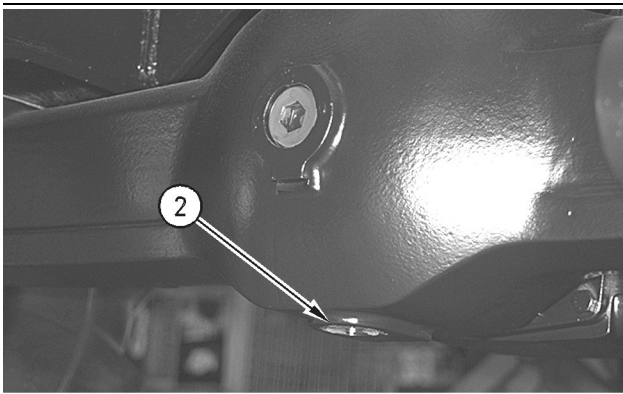


Illustration 267

g00333762

(2) Drain plug

Operate the machine for an adequate amount of time in order to warm the lubricant.

Filler plug (1) and drain plug (2) are located under the machine on the rear axle.

Note: Refer to the Operation and Maintenance Manual, "General Hazard Information" for information in containing fluid spillage.

1. Remove the dirt that is around filler plug (1) and around drain plug (2).
2. Remove drain plug (2). Drain the lubricant into a suitable container.

Note: Dispose of any used lubricant according to local regulations.

3. Clean drain plug (2).

4. Inspect the O-ring seal. If damage or wear is noticed on the O-ring seal, replace the seal.
5. Install drain plug (2).
6. Remove filler plug (1).
7. Fill the axle with lubricant to the bottom of the filler plug opening. See Operation and Maintenance Manual, "Refill Capacities".
8. Clean filler plug (1).
9. Inspect the O-ring seal. If damage or wear is noticed on the O-ring seal, replace the seal.
10. Install filler plug (1).

i00312048

Axle Oil Level (Front) - Check

SMCS Code: 3278-535

The front axle is the axle which steers the machine. The rear axle is the one with the gearbox.

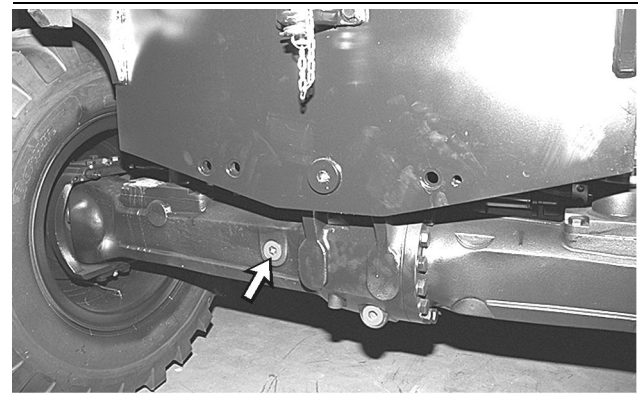


Illustration 268

g00102631

1. Remove the dirt that is around the filler plug.
2. Remove the filler plug.
3. Maintain the lubricant level to the bottom of the filler plug opening. Add lubricant through the filler plug opening, as needed.
4. Clean the filler plug.
5. Inspect the O-ring seal. If damage or wear is noticed on the O-ring seal, replace the seal.
6. Install the filler plug.

i00703208

Axle Oil Level (Rear) - Check

SMCS Code: 3278-535

The front axle is the axle which steers the machine.
The rear axle is the one with the gearbox.

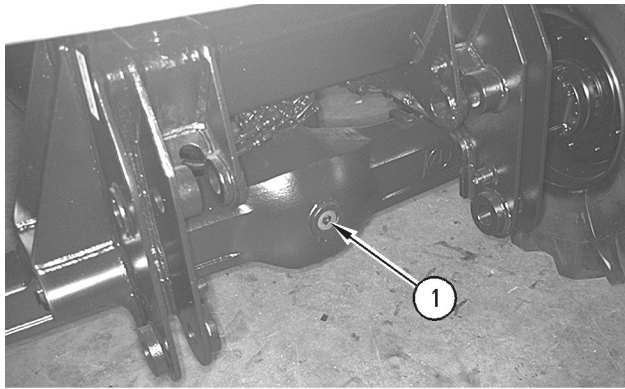


Illustration 269

g00102672

(1) Filler plug

1. Remove the dirt that is around the filler plug (1).
2. Remove filler plug (1).
3. Maintain the lubricant level to the bottom of the filler plug opening. Add lubricant through the filler plug opening, as needed.
4. Clean filler plug (1).
5. Inspect the O-ring seal. If damage or wear is noticed on the O-ring seal, replace the seal.
6. Install filler plug (1).

i00060143

Axle Oscillation Bearings - Lubricate

SMCS Code: 3268-086-BD; 3268; 3278-086-BD; 3278; 3282; 4313

Wipe all the grease fittings before you apply grease.

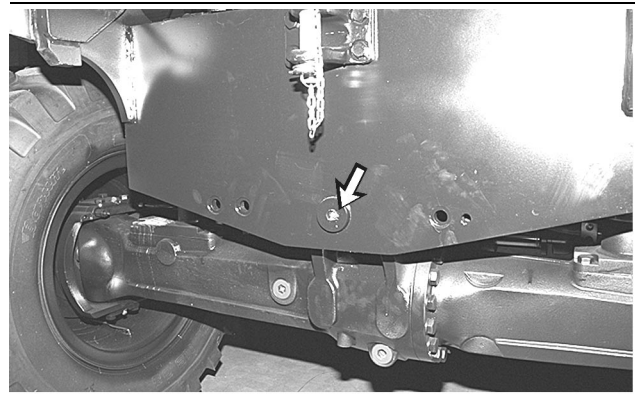


Illustration 270

g00102404

A steer axle pin is positioned at the front of the machine. A grease fitting is positioned on the front of the steer axle pin. Apply grease to this grease fitting.

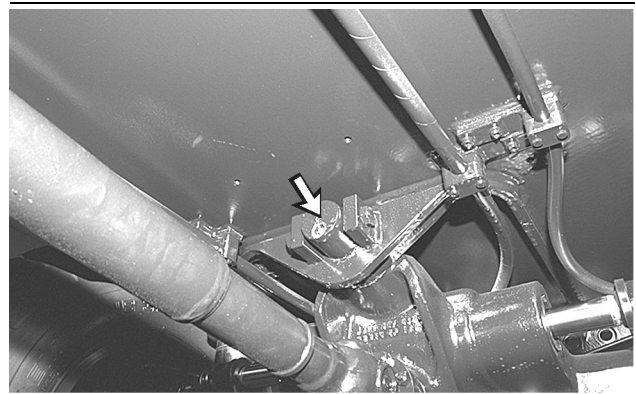


Illustration 271

g00102405

A grease fitting is also positioned on the rear of the steer axle pin. Apply grease to this grease fitting.

i00059329

Battery - Recycle

SMCS Code: 1401-561

Always recycle a battery. Never discard a battery.

Always return used batteries to one of the following locations:

- A battery supplier
- An authorized battery collection facility
- Recycling facility

i00663586

i01048535

Battery, Battery Cable or Battery Disconnect Switch - Replace

SMCS Code: 1401-510; 1402-510; 1402-510

1. Turn the engine start switch to the OFF position. Turn all switches to the OFF position.
2. Turn the battery disconnect switch to the OFF position. Remove the disconnect switch key.
3. Remove the secondary steering fuse.
4. Disconnect the battery cable at the battery disconnect switch. The battery disconnect switch is connected to the machine frame.

Note: Do not allow the disconnected battery cable to contact the battery disconnect switch.

5. Disconnect the negative battery cable at the battery that is connected to the battery disconnect switch. If the machine has four 12 volt batteries, disconnect the negative battery cables of two batteries.
6. Make all of the necessary repairs or replace the battery.
7. Connect the negative battery cable at the battery.
8. Connect the negative battery cable at the battery that is connected to the battery disconnect switch.
9. Install the secondary steering fuse.
10. Connect the battery cable at the battery disconnect switch.
11. Install the disconnect switch key and turn the battery disconnect switch to the ON position.

i00934872

Battery Hold-Down - Tighten

SMCS Code: 7257

Tighten the hold-downs for the battery in order to prevent the batteries from moving during machine operation.

Blade Linkage - Lubricate (If Equipped)

SMCS Code: 6060-086-KL

Note: Caterpillar recommends the use of **5P-0960** Molybdenum Grease for lubricating the boom, stick and bucket linkage. Refer to Operation and Maintenance Manual, SEBU6250, "Lubricating Grease" for more information on the Molybdenum Grease.

Wipe all fittings before lubricating.

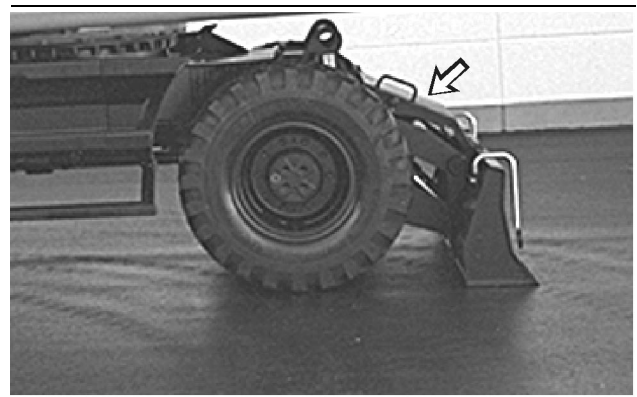


Illustration 272

g00103933

1. Raise the access cover.

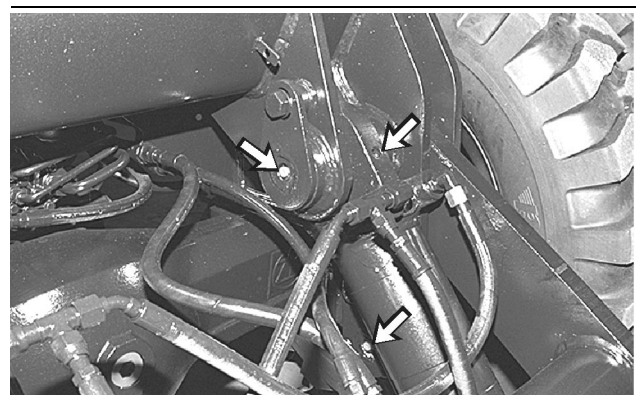


Illustration 273

g00103934



Illustration 274

g00103935

2. Apply lubricant through the six fittings that are shown in Illustrations 273 and 274 on each side of the blade. There are a total of 12 fittings.
3. Close the access cover.

i00772423

Boom and Stick Linkage - Lubricate

SMCS Code: 6501-086; 6502-086

S/N: 6ES216-228

Material Handler

Note: For some applications of the machine, the repeated duty cycle of the front linkage may only require small angular movements of the boom or stick. There might not be enough angular motion in order to distribute the grease between the pin and the bearing. The operator should operate the boom, the stick and the implement in order to distribute the grease within the joint assemblies.

Service a new machine after Every 10 Service Hours only within the initial 100 service hours.

After the initial 100 service hours of operation, service the boom, the stick, and the implement linkage after Every 50 Service Hours.

Note: If the machine is operated under severe conditions that might cause abrasive material to enter the bearings, service the linkage after Every 10 Service Hours.

1. Wipe all fittings before you apply lubricant.

Use Steps 1.a through 1.c to ensure proper lubrication:

- a. Lower the boom and the attachment to the ground.
- b. Apply a slight downward pressure on the attachment.
- c. Apply grease through the grease fitting.

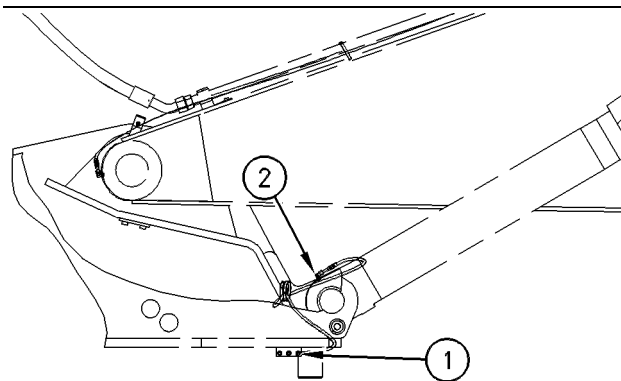


Illustration 275

g00291582

- (1) Fitting
(2) Fitting

2. Apply lubricant through fitting (1) for the left boom cylinder.
3. Apply lubricant through fitting (2) for the right boom cylinder.

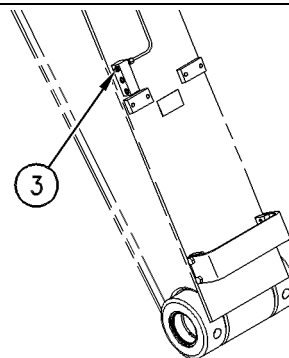


Illustration 276

g00293215

- (3) Fitting

4. Apply lubricant through fitting (3).

Note: This fitting supplies grease to all other bearings except the bearings on the stick end through a distribution valve. The distribution valve is designed to give the proper amount of grease to all bearings. If the distribution valve will not accept grease, one of the lines is blocked.

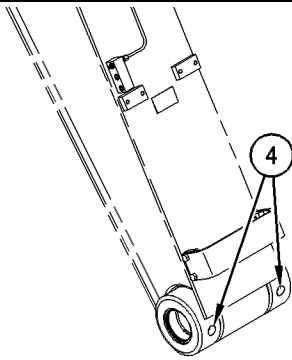


Illustration 277

g00354254

(4) Fitting

5. Apply lubricant through fitting (4).

i00771982

Boom and Stick Linkage - Lubricate

SMCS Code: 6501-086; 6502-086

S/N: 6WL1-Up

S/N: 6ES229-Up

S/N: 8SS1-Up

S/N: 9PS1-Up

Note: For some applications of the machine, the repeated duty cycle of the front linkage may only require small angular movements of the boom or stick. There might not be enough angular motion in order to distribute the grease between the pin and the bearing. The operator should operate the boom, the stick and the implement in order to distribute the grease within the joint assemblies.

Service a new machine after Every 10 Service Hours only within the initial 100 service hours.

After the initial 100 service hours of operation, service the boom, the stick, and the implement linkage after Every 50 Service Hours.

Note: If the machine is operated under severe conditions that might cause abrasive material to enter the bearings, service the linkage after Every 10 Service Hours.

1. Wipe all fittings before you apply lubricant.

Use Steps 1.a through 1.c to ensure proper lubrication:

- a. Lower the boom and the attachment to the ground.
- b. Apply a slight downward pressure on the attachment.
- c. Apply grease through the grease fitting.

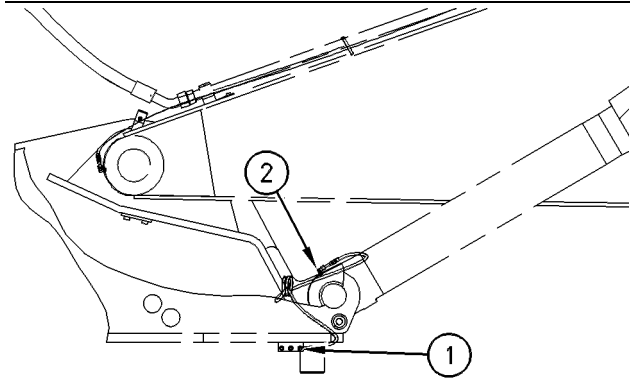


Illustration 278

g00291582

(1) Fitting
(2) Fitting

2. Apply lubricant through fitting (1) for the left boom cylinder.

3. Apply lubricant through fitting (2) for the right boom cylinder.

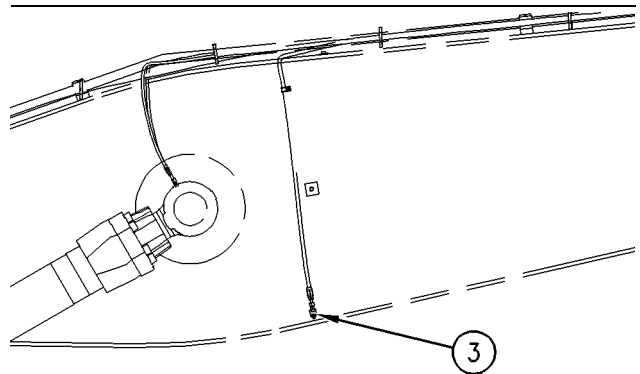


Illustration 279

g00291565

(3) Fitting

4. Apply lubricant through fitting (3).

Note: This fitting supplies grease to all other bearings except the bearings on the stick end through a distribution valve. The distribution valve is designed to give the proper amount of grease to all bearings. If the distribution valve will not accept grease, one of the lines is blocked.

i01047178

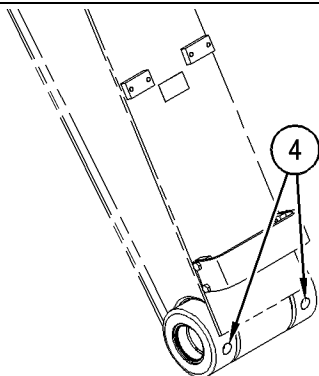


Illustration 280

g00354937

(4) Fittings

5. Apply lubricant through fittings (4).

i01047177

Boom, Stick and Bucket Linkage - Lubricate (Ditch Cleaning Bucket (If Equipped))

SMCS Code: 6501-086; 6502-086; 6513-086

Note: Caterpillar recommends the use of **5P-0960** Molybdenum Grease for lubricating the boom, stick and bucket linkage. Refer to Operation and Maintenance Manual, SEBU6250, "Lubricating Grease" for more information on the Molybdenum Grease.

1. Wipe all fittings before you apply lubricant.

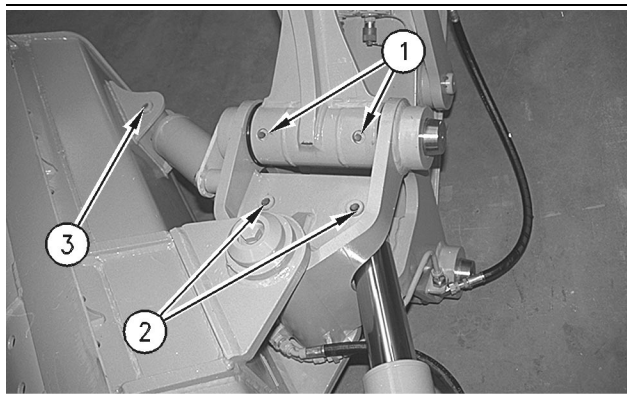


Illustration 281

g00354074

(1) Fittings
(2) Fittings
(3) Fitting

2. Apply lubricant through fittings (1), (2) and (3).

Boom, Stick and Bucket Linkage - Lubricate

SMCS Code: 6501-086; 6502-086; 6513-086

Note: Caterpillar recommends the use of **5P-0960** Molybdenum Grease for lubricating the boom, stick and bucket linkage. Refer to Operation and Maintenance Manual, SEBU6250, "Lubricating Grease" for more information on Molybdenum Grease.

1. Wipe all fittings before you apply lubricant.

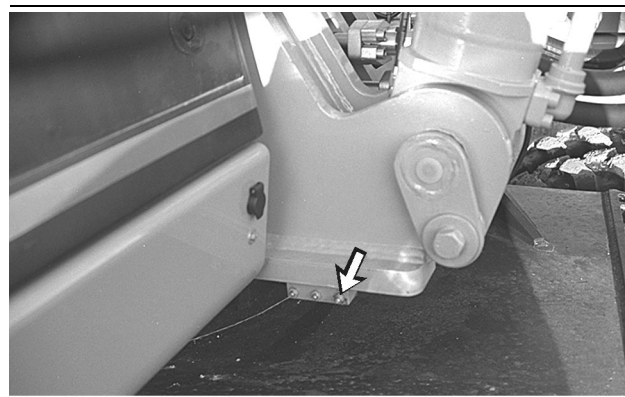


Illustration 282

g00102387

2. Apply lubricant through the front grease fitting that is by the head end of the right boom cylinder.

Note: This fitting supplies grease to all linkage bearings from the frame to the nose of the boom. The valve is designed to give the proper amount of grease to all bearings. If the valve will not accept grease, one of the lines is blocked.

Use Steps 2.a through 2.d to ensure proper lubrication.

- a. Apply grease through the grease fitting while the boom is raised and all of the implement is suspended.
- b. Lower the boom and the implement to the ground.
- c. Apply a slight downward pressure on the implement.
- d. Apply grease through the grease fitting.

i00664174

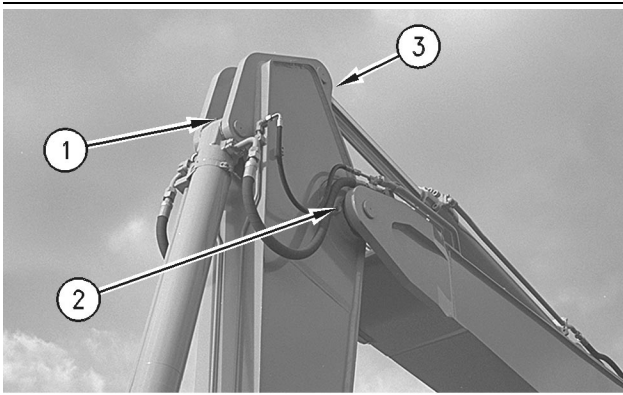


Illustration 283

g00105234

- (1) Fitting
- (2) Fittings
- (3) Fitting

3. Apply lubricant through fittings (1), (2), and (3).

Note: Fitting (2) is located on each side of the stick.

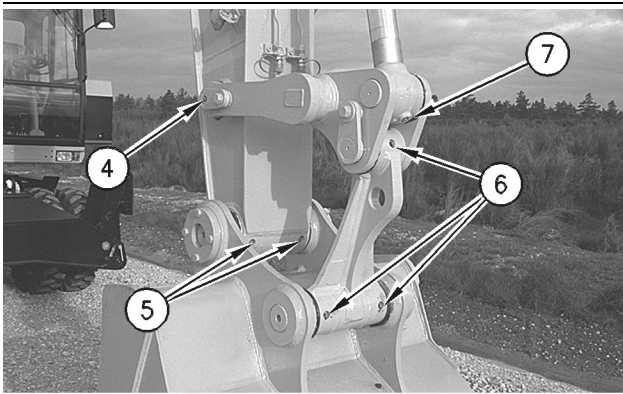


Illustration 284

g00105235

- (4) Fitting
- (5) Fittings
- (6) Fittings
- (7) Fitting

4. Apply lubricant through fittings (4), (5), (6), and (7).

Brakes, Indicators and Gauges - Test

SMCS Code: 4251-081; 4267-081; 4269-081;
7450-081; 7490-081

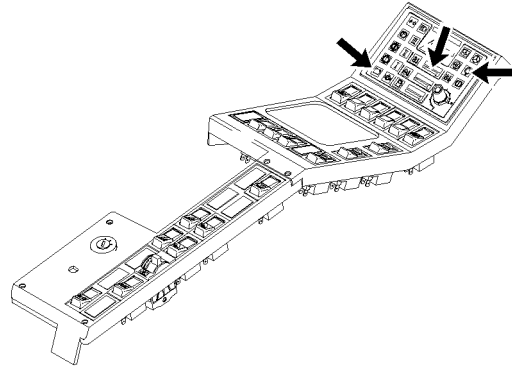


Illustration 285

g00291446

1. Look for broken lenses and for broken indicator lights.
2. Start the engine.
3. Look for inoperative gauges.
4. Turn on all machine lights. Check for proper operation.
5. Sound the horn.
6. Move the machine forward. Release the travel pedal. Depress the service brake pedal. The machine should stop.
7. Stop the engine.
8. Before you operate the machine, make all necessary repairs.

i00767599

Braking System - Test

SMCS Code: 4250-081

Service Brake Holding Ability Test

WARNING

Personal injury can result from a sudden stop during brake test.

Make sure the area is clear of personnel and obstructions before testing the brakes. Fasten the seat belt before moving the machine.

If the machine begins to move during the test, engage the parking brake immediately.

Make sure that the area around the machine is clear of personnel and of obstacles.

Test the service brakes on a dry, level surface.

Fasten the seat belt before you test the brakes.

The following test determines if the service brakes are functional. This test is not intended to measure the maximum brake holding effort. The maximum brake holding effort that is required to hold a machine stationary at a certain engine rpm varies between machines. These differences are caused by differences in the following factors:

- Engine setting
- Power train efficiency
- Brake holding ability
- Other factors

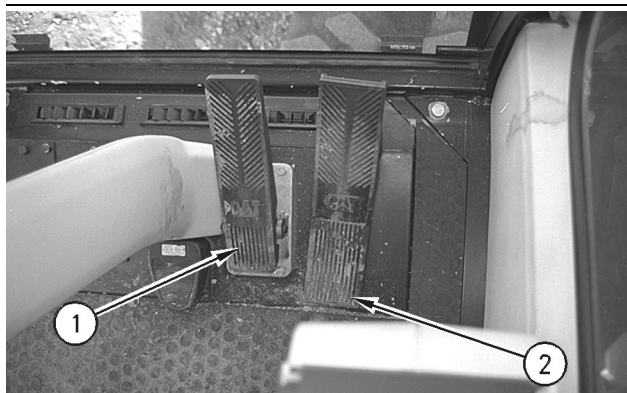


Illustration 286

g00102514

- (1) Service brake pedal
(2) Travel speed pedal

1. Start the engine. Keep the engine speed at low idle.
2. Slightly raise all implements.
3. Depress service brake pedal (1).

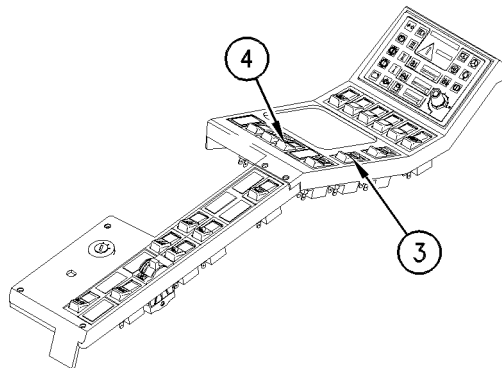


Illustration 287

g00291447

- (3) Parking brake switch
(4) Transmission control

4. Release the parking brake by using parking brake switch (3).
5. Place transmission control (4) in the FIRST GEAR position.
6. Without releasing the service brake pedal, depress the front of travel speed pedal (2) to the FORWARD position. The machine should not move. Release the travel speed pedal.
7. Engage parking brake (3). This is the end of the test of the service brakes.
8. Lower all the implements to the ground. Apply a slight downward pressure to the control lever.
9. Stop the engine.

NOTICE

If the machine moved while testing the service brakes, contact your Caterpillar dealer.

Have the dealer inspect and, if necessary, repair the service brakes before returning the machine to operation.

Testing the Brake Accumulator

1. Move the engine start switch key to the ON position.

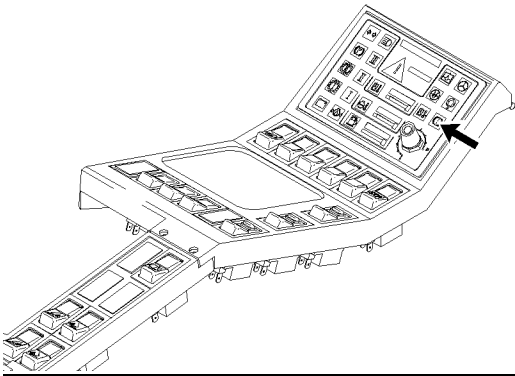


Illustration 288

g00291450

2. The low brake pressure indicator should come on if the accumulator is not at normal operating pressure.
3. Start the engine.
4. Run the engine for two minutes in order to increase the accumulator pressure. The low brake pressure indicator should turn off.
5. Stop the engine.
6. While the engine is stopped, turn the engine start switch to the ON position. Apply the service brakes five times. If the low brake pressure indicator comes on within five applications of the service brakes, consult your Caterpillar dealer.

i01117817

Bucket Tips - Inspect/Replace

SMCS Code: 6805-040; 6805-510

WARNING

Personal injury or death can result from bucket falling.

Block the bucket before changing bucket tips or side cutters.

Bucket Tips

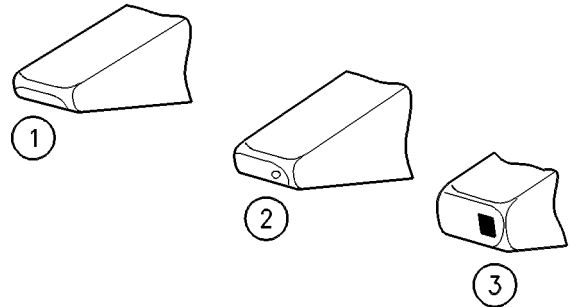


Illustration 289

g00101352

- (1) Usable
- (2) Replace this bucket tip.
- (3) Overworn

Check the bucket tips for wear. If the bucket tip has a hole, replace the bucket tip.

1. Remove the pin from the bucket tip. The pin can be removed by one of the following methods.
 - Use a hammer and a punch from the retainer side of the bucket to drive out the pin.
 - Use a Pin-Master. Follow Step 1.a through Step 1.c for the procedure.

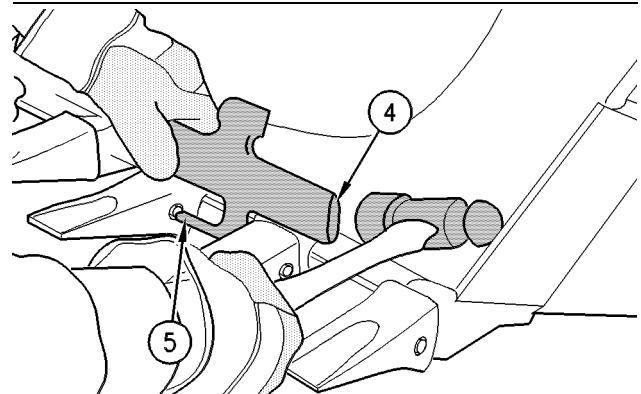


Illustration 290

g00590670

- (4) Back of Pin-Master
- (5) Extractor

- a. Place the Pin-Master on the bucket tooth.
- b. Align extractor (5) with the pin.
- c. Strike the Pin-Master at the back of the tool (4) and remove the pin.

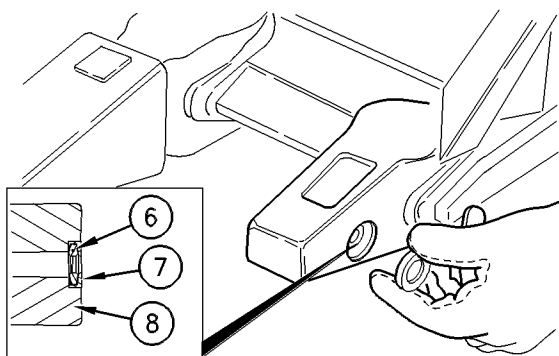


Illustration 291

g00590819

- (6) Retainer
- (7) Retaining washer
- (8) Adapter

2. Clean the adapter and the pin.
3. Fit retainer (6) into retaining washer (7). Install this assembly into the groove that is in the side of adapter (8).

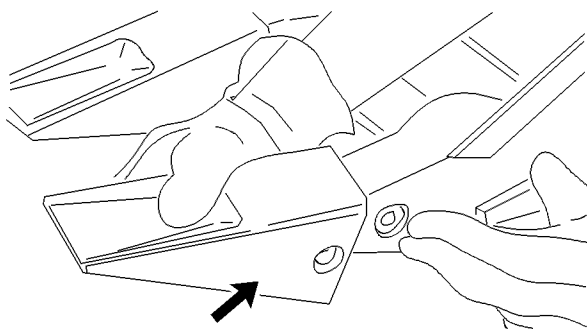


Illustration 292

g00101359

4. Install the new bucket tip onto the adapter.

Note: The bucket tip can be rotated by 180 degrees in order to allow greater penetration or less penetration.

5. Drive the pin through the bucket tip. The pin can be installed by using one of the following methods:
 - From the other side of the retainer, drive the pin through the bucket tip, the adapter, and the retainer.
 - Use a Pin-Master. Follow Step 5.a through Step 5.e for the procedure.

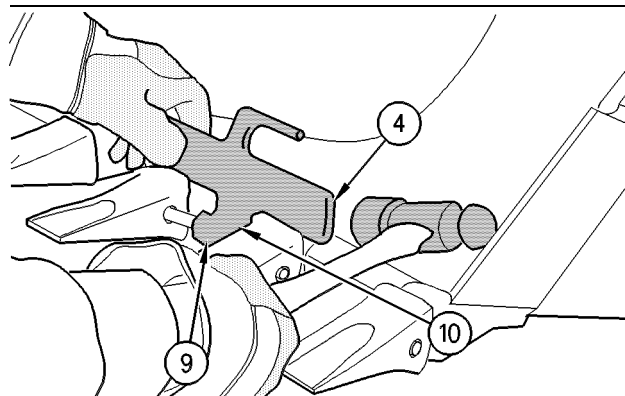


Illustration 293

g00590666

- (4) Back of Pin-Master
- (9) Pin setter
- (10) Pin holder

- a. Insert the pin through the bucket tooth.
- b. Place the Pin-Master over the bucket tooth and locate the pin in the hole of holder (10).
- c. Strike the tool with a hammer at the back of the tool (4) in order to start the pin.
- d. Slide pin holder (10) away from the pin and rotate the tool slightly in order to align pin setter (9) with the pin.
- e. Strike the end of the tool until the pin is fully inserted.
6. After you drive the pin, make sure that the retainer fits snugly into the pin groove.

Side Cutters

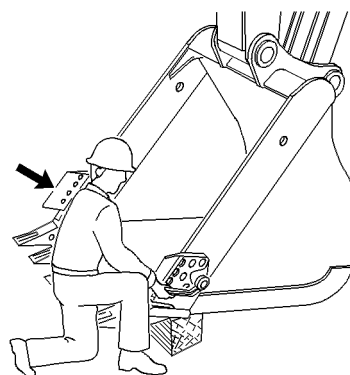


Illustration 294

g00114738

1. Remove the mounting bolts and the side cutters.
2. Clean the mounting surfaces.

Note: Some side cutters may be rotated for additional wear.

3. Install the new side cutters or the rotated side cutters.

i00723043

Cab Air Filter - Clean/Replace

SMCS Code: 7342-070; 7342-510

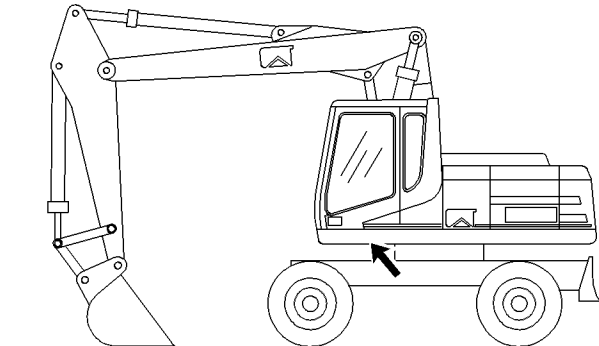


Illustration 295

g00291487

The cab air filters are under the cab.



Illustration 296

g00105242

Not all machines are equipped with a fixed cab riser.

1. Remove the rear access cover on the fixed cab riser (if equipped).

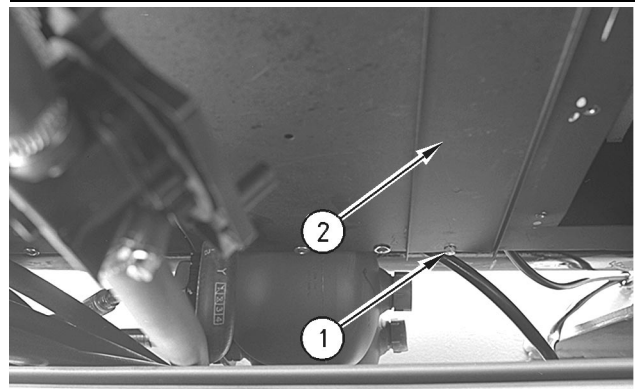


Illustration 297

g00102283

- (1) Screws
(2) Cover for the cab air filter

2. Remove two screws (1) and cover (2).
3. Remove the filters.
4. Clean the filters with pressure air or wash the filters in a solution of warm water and nonsudsing household detergent.
5. Rinse the filters in clean water. Thoroughly air dry the filters.
6. Install the filters.
7. Install cover (2). Secure the cover with two screws (1).
8. Replace the access cover to the cab riser compartment.

i00765802

Cab Riser (Adjustable) Linkage - Lubricate

SMCS Code: 7260-086-KL

S/N: 8SS1-Up

S/N: 9PS1-Up

Service the linkage after Every 500 Service Hours while the cab is in the lowered position.

1. Wipe all fittings before you apply lubricant.

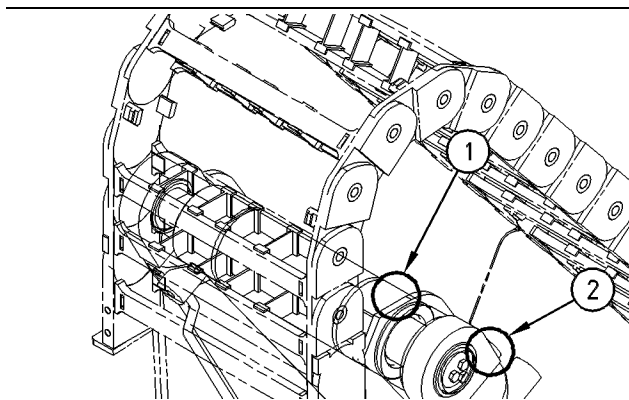


Illustration 298

g00349372

2. Apply lubricant through fittings (1) and (2) on both sides of the linkage.

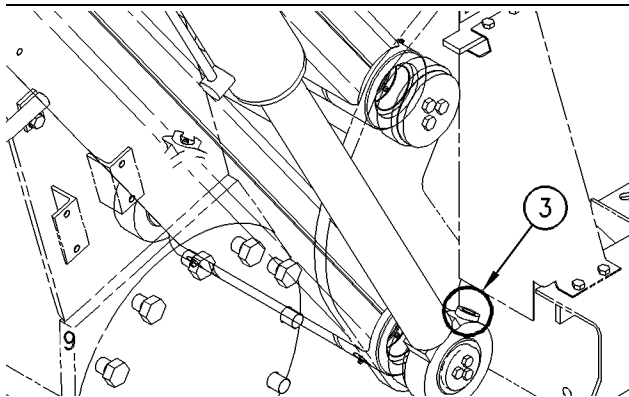


Illustration 299

g00352012

3. Apply lubricant through fitting (3) on each side of the linkage.

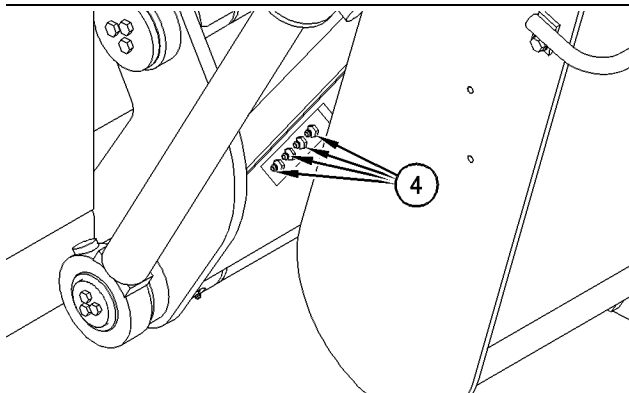


Illustration 300

g00349232

4. Apply lubricant through fittings (4) on the left side of the linkage.

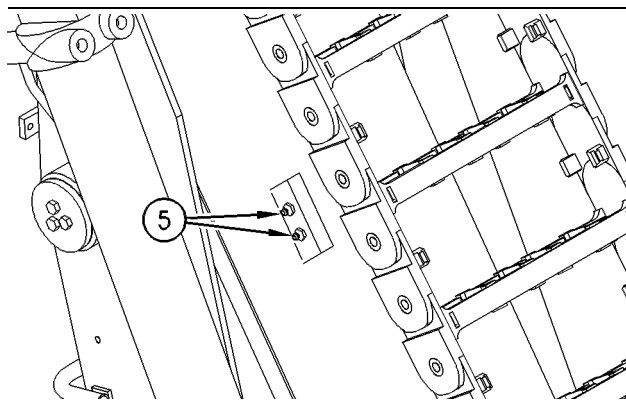


Illustration 301

g00353312

5. Apply lubricant through fittings (5) on the right side of the linkage.

i00662834

Condenser (Refrigerant) - Clean (If Equipped)

SMCS Code: 1805-070

WARNING

Bodily injury can occur from unexpected contact with open cab doors on machines equipped with a fixed cab riser.

To avoid injury, close the cab door before climbing onto the rear of the machine.

NOTICE

If excessively dirty, clean condenser with a brush. To prevent damage or bending of the fins, do not use a stiff brush.

Repair the fins if found defective.

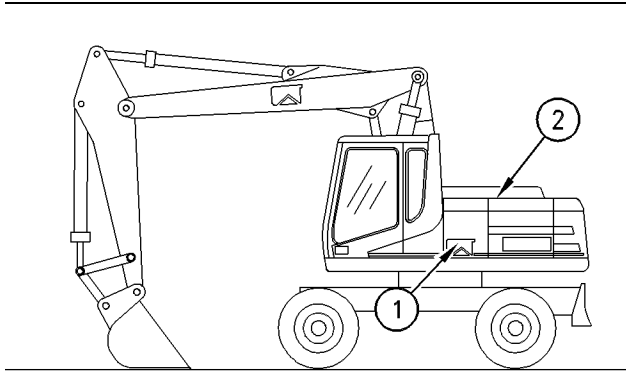


Illustration 302

g00290119

- (1) Access door
(2) Access cover

1. Open access door (1) that is on the left side of the machine. Secure the access door.
2. Open access cover (2).

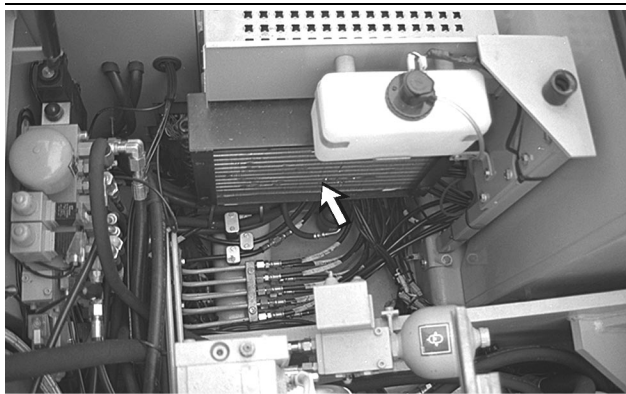


Illustration 303

g00101950

3. Inspect the condenser for debris. Clean the condenser, if necessary.
4. Use clean water to wash off all dust and dirt from the condenser.
5. Close the access door and the access cover.

i00723467

Cooling System Coolant (ELC) - Change

SMCS Code: 1350-044

NOTICE

Do not change the coolant until you read and understand the material in the Operation and Maintenance Manual, "Cooling System Specifications".

NOTICE

Mixing Extended Life Coolant (ELC) with other products reduces the effectiveness of the coolant and shortens coolant life. Use only Caterpillar products or commercial products that have passed the Caterpillar EC-1 specifications for premixed or concentrate coolants. Use only Caterpillar Extender with Caterpillar ELC. Failure to follow these recommendations could result in the damage to cooling systems components.

If ELC cooling system contamination occurs, refer to Operation and Maintenance, "Extended Life Coolant (ELC)" under the topic ELC Cooling System Contamination.

This machine was filled with Extended Life Coolant at the factory.

If the coolant is dirty or if you observe any foaming in the cooling system, drain the coolant before the recommended interval.

If the coolant in the machine is changed to Extended Life Coolant from another type of coolant, see Operation and Maintenance Manual, "Extended Life Coolant (ELC) Cooling System Maintenance".

WARNING

Bodily injury can occur from unexpected contact with open cab doors on machines equipped with a fixed cab riser.

To avoid injury, close the cab door before climbing onto the rear of the machine.

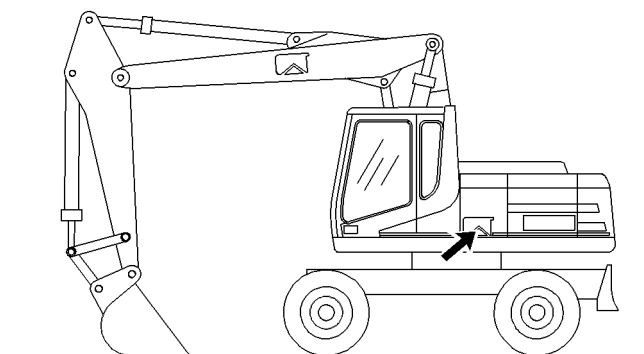


Illustration 304

g00289939

1. Open the access door on the left side of the machine. Secure the access door.

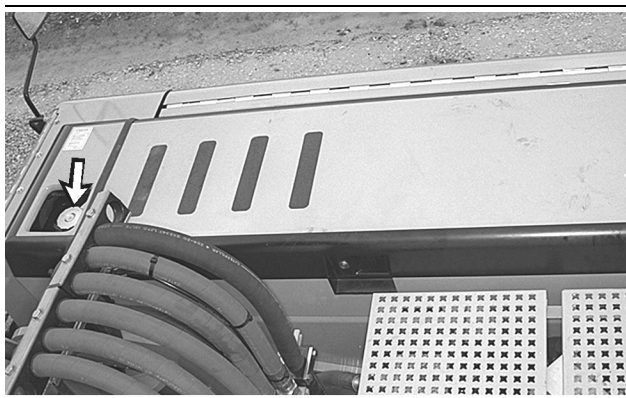


Illustration 305

g00102896

2. The radiator is at the top right of the machine. The pressure cap is above the radiator. Open the access cover to the pressure cap. Slowly loosen the pressure cap in order to relieve the system pressure. Remove the pressure cap.
3. There is a cover under the radiator. Remove the screws and the cover under the radiator in order to expose the drain valve in Illustration 306.

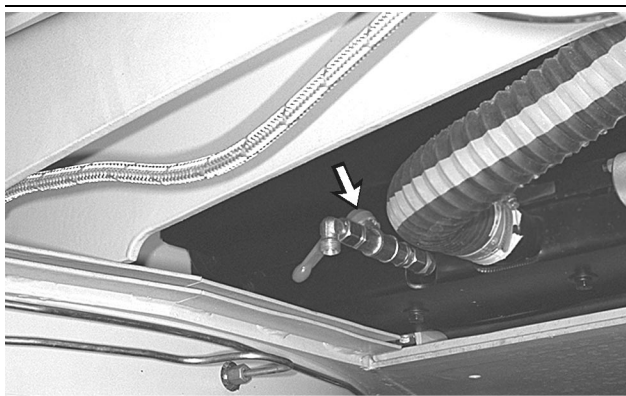


Illustration 306

g00102897

Note: Refer to the Operation and Maintenance Manual, "General Hazard Information" for information in containing fluid spillage.

4. Open the drain valve. Allow the coolant to drain into a suitable container.

Note: Dispose of drained fluids according to local regulations.

5. Flush the cooling system with clean water until the draining water is clean.
6. Close the drain valve. Replace the cover under the radiator and secure the cover under the radiator.
7. Add the Extended Life Coolant. Refer to the following topics:

- Operation and Maintenance Manual, "Cooling System Specifications"
- Operation and Maintenance Manual, "Refill Capacities"

8. Start the engine. Run the engine without the pressure cap. Run the engine until the water temperature regulator opens and the coolant level stabilizes.

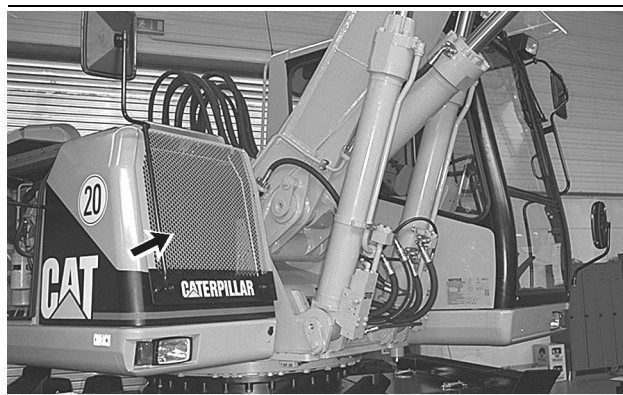


Illustration 307

g00102898

This is a typical example of the radiator access cover.

9. Open the radiator access cover. Secure the access cover.

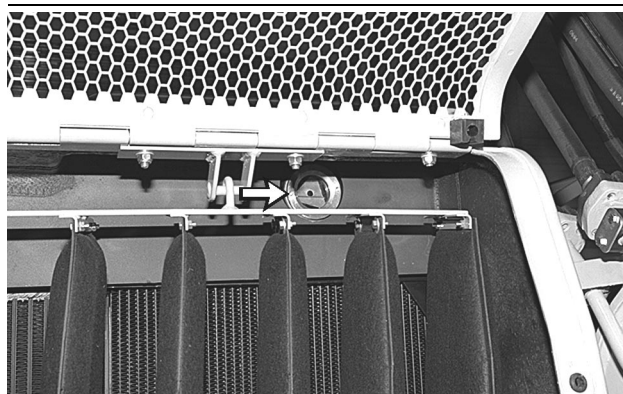


Illustration 308

g00102899

10. Maintain the coolant level to the center of the sight gauge.

11. Install the pressure cap.

12. Stop the engine.

13. Close all access covers and the access door. Secure all access covers and the access door.

i00767761

Cooling System Coolant Extender (ELC) - Add

SMCS Code: 1352; 1353; 1395

Note: This machine was filled with Caterpillar Extended Life Coolant at the factory.

When Caterpillar Extended Life Coolant (ELC) is used, a Caterpillar ELC Extender must be added to the cooling system. See the Operation and Maintenance Manual, "Coolant Recommendations" for all cooling system requirements.

Use an **8T-5296** Coolant Conditioner Test Kit to check the concentration of the coolant.

NOTICE

Use only Caterpillar products or commercial products that have passed Caterpillar EC-1 specification for pre-mixed or concentrated coolants.

Use only Caterpillar Extender with Extended Life Coolant.

Mixing Extended Life Coolant with other products reduces the Extended Life Coolant service life. Failure to follow the recommendations can reduce cooling system components life unless appropriate corrective action is performed.

Note: Refer to Operation and Maintenance Manual, "Extended Life Coolant (ELC)" for instructions regarding contamination of the ELC Cooling System.

Note: It is acceptable to add an additive which is intended for cooling systems that are using DEAC to cooling systems that are using Caterpillar Extended Life Coolant. If this is done, follow the Operation and Maintenance Manual, "Maintenance Interval Schedule" for cooling systems that are using DEAC.

WARNING

Bodily injury can occur from unexpected contact with open cab doors on machines equipped with a fixed cab riser.

To avoid injury, close the cab door before climbing onto the rear of the machine.

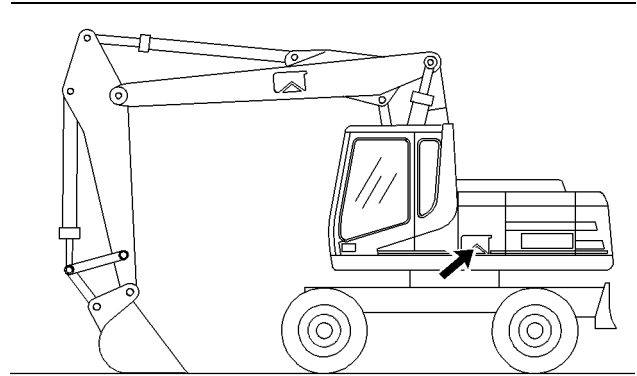


Illustration 309

g00289939

1. Open the access door on the left side of the machine. Secure the access door.

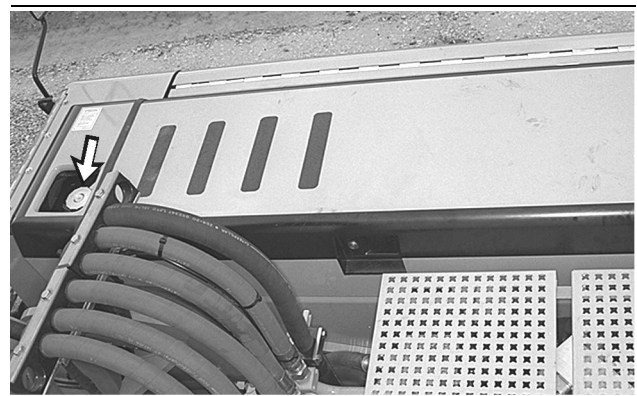


Illustration 310

g00102583

2. The radiator is at the top right of the machine. Open the access cover for the pressure cap. Slowly loosen the pressure cap in order to relieve the pressure. Remove the pressure cap.
3. You may be required to drain enough coolant from the radiator in order to allow the addition of the Caterpillar ELC Extender. If this is necessary, refer to Operation and Maintenance Manual, "Cooling System Coolant (ELC) - Change" for the location of the radiator drain valve.

Note: Dispose of drained fluids according to local regulations.

4. Add the proper amount of Caterpillar ELC Extender to the cooling system. Refer to Operation and Maintenance Manual, "Refill Capacities" and Operation and Maintenance Manual, "Extended Life Coolant (ELC)" for the proper quantity.
5. Replace the pressure cap if the gasket is damaged. Install the pressure cap. Close the cover over the pressure cap.

6. Close and secure the access door on the left side of the machine.

i00753656

Cooling System Level - Check

SMCS Code: 1350-535

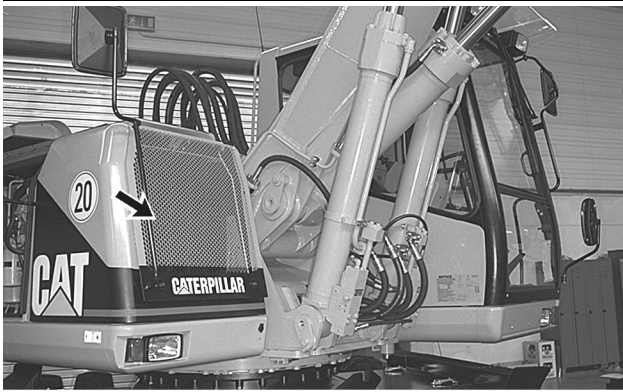


Illustration 311

g00102304

This is a typical example of a radiator access cover.

1. Open the radiator access cover. Secure the radiator access cover.

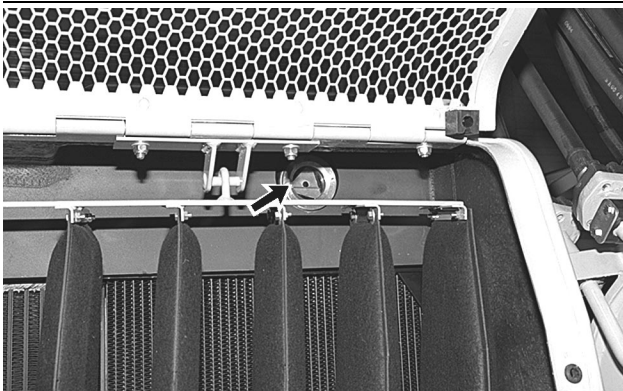


Illustration 312

g00102305

2. Maintain the coolant level to the center of the sight gauge.

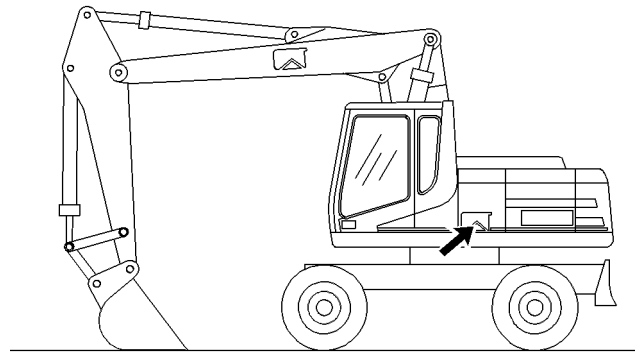


Illustration 313

g00289939

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" on containing fluid spillage.

3. If additional coolant is needed, open the access door on the left side of the machine. Secure the access door.

WARNING

Bodily injury can occur from unexpected contact with open cab doors on machines equipped with a fixed cab riser.

To avoid injury, close the cab door before climbing onto the rear of the machine.

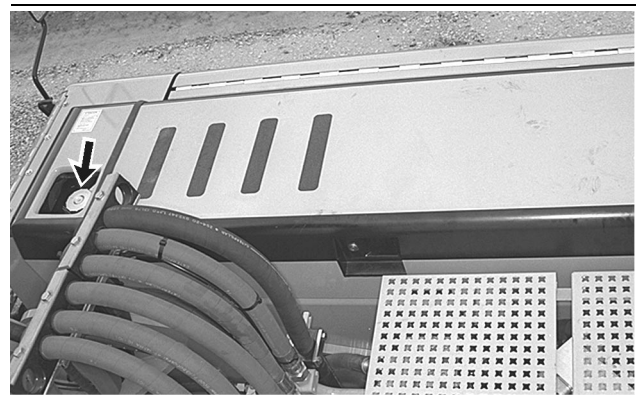


Illustration 314

g00102309

4. The pressure cap is on the top right side of the machine. Open the access cover to the pressure cap. Slowly loosen the pressure cap in order to relieve the system pressure.

If you must add coolant daily, check the coolant system for leaks.

5. Remove the pressure cap.
6. Add the coolant.

7. Inspect the pressure cap and the cap seal for the following defects:

- Damage
- Deposits
- Foreign material

Clean the pressure cap with a clean cloth or replace the pressure cap if the pressure cap is damaged.

8. Install the pressure cap. Close the access cover to the pressure cap.

9. Close the access door on the left side of the machine.

10. Inspect the radiator core for debris. Clean the radiator core, as needed. See Operation and Maintenance Manual, "Radiator Core - Clean".

11. Close the radiator access cover and secure the radiator access cover.

i00723775

Cooling System Water Temperature Regulator - Replace

SMCS Code: 1355-510

Note: Refer to the Service Manual, "Disassembly and Assembly" for detailed instructions regarding the cooling system.

Replacing the water temperature regulator prior to failure is a recommended preventive maintenance practice. This replacement will reduce the chances for cooling system problems and for unscheduled downtime.

If one of the following conditions is met, the replacement of the water temperature regulator can be done:

- The cooling system is drained and the cooling system is cleaned.
- The cooling system is drained to a level that is below the water temperature regulator housing. This is the best option if only the water temperature regulator is being replaced.

NOTICE

Failure to replace the water temperature regulators on a regularly scheduled basis could cause severe engine damage.

Never operate the engine without the water temperature regulators installed.

If the water temperature regulator is installed incorrectly, the engine may overheat, causing cylinder head damage. Ensure that the new water temperature regulator is installed in the original position.

Note: Always discard drained fluids according to local regulations.

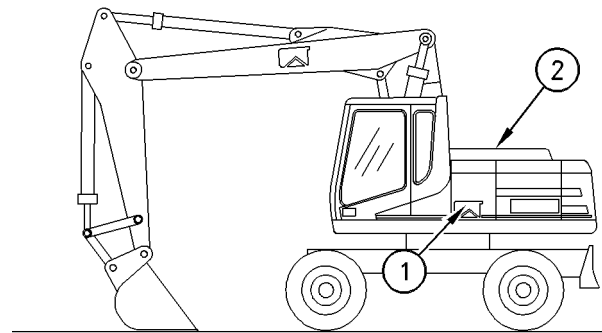


Illustration 315

g00317003

- (1) Access door
(2) Access cover

1. Access door (1) is on the left side of the machine. Open access door (1). Secure the access door.

WARNING

Bodily injury can occur from unexpected contact with open cab doors on machines equipped with a fixed cab riser.

To avoid injury, close the cab door before climbing onto the rear of the machine.

2. Open access cover (2).

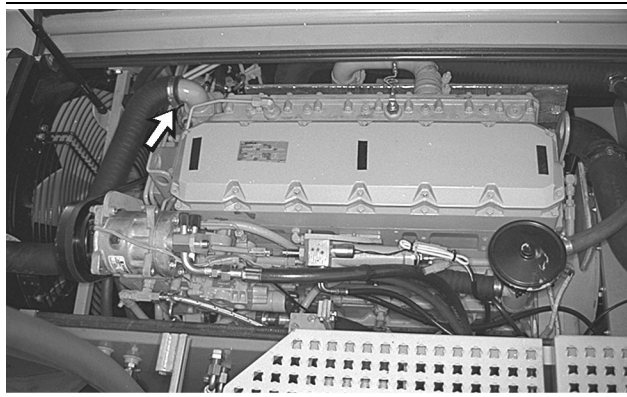


Illustration 316

g00102923

3. Loosen the hose clamp. Remove the hose from the elbow.
 4. Remove the bolts from the elbow. Remove the elbow. Remove the gasket.
 5. Remove the water temperature regulator from the water temperature regulator housing.
- Note:** Inspect the gasket before assembly. If wear or damage is found, replace the gasket.
6. Install a new water temperature regulator. Install the gasket. Install the elbow. Install the bolts in the elbow.
 7. Connect the hose to the elbow. Tighten the hose clamps.
 8. Restore the coolant level to the correct operating level. Refer to the Operation and Maintenance Manual, "Cooling System Level - Check" for details.
 9. Close and secure access cover (2). Close and secure access door (1).

Drive Shaft Support Bearing Lubricant - Check (If Equipped)

SMCS Code: 3267-535

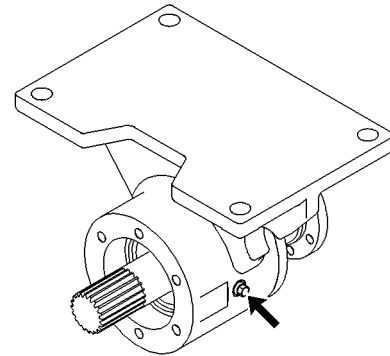


Illustration 317

g00102456

The drive shaft support bearings are located below the center of the machine.

1. Remove the plug.
2. Check the lubricant level. The bearings should be covered with lubricant.

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" for information in Containing Fluid Spillage.

3. If necessary, add lubricant.

i00995144

Drive Shaft Universal Joint - Lubricate

SMCS Code: 3251-086; 3253-086

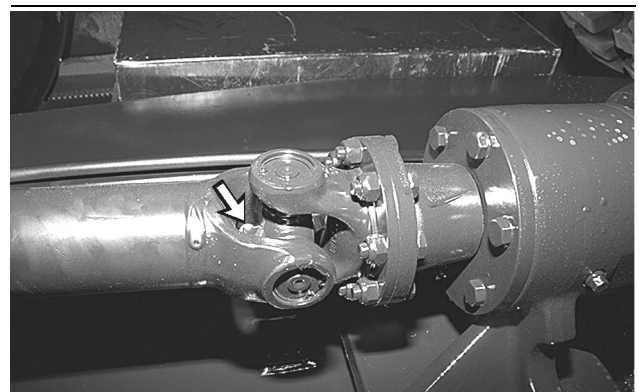


Illustration 318

g00102443

The grease fittings are located below the center of the machine.

Apply grease to the one fitting on the universal joint at both ends of the drive shaft. Some machines are equipped with two-piece drive shafts. The two-piece drive shaft has two additional fittings.

i00995186

Drum Brakes - Inspect (If Equipped)

SMCS Code: 4252-040

The brake shoe pads should be inspected more frequently than every 1000 service hours or 6 months when the brake shoe pads are near replacement.

1. Remove the wheel on the rear axle.

Note: Refer to Disassembly and Assembly Manual, SENR6258, "Remove & Install Tire & Rim Assemblies (Rear)" for more information on removing the rear tire and installing the rear tire.

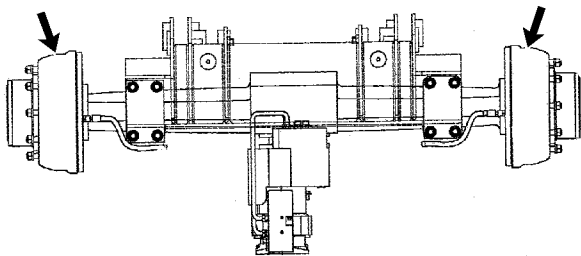


Illustration 319

g00103930

2. Remove the brake drums.
3. Visually inspect the brake line for leaks. Repair any leaks. Replace any parts that are worn or damaged.

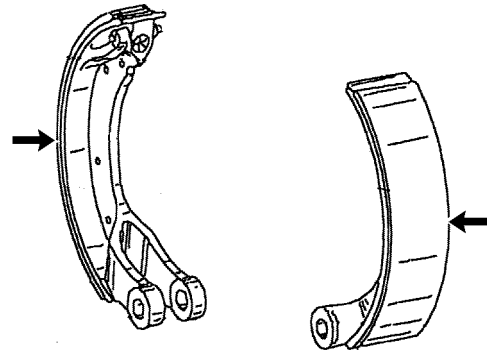


Illustration 320

g00103931

4. Measure the thickness of the brake shoe pad. If the thickness of the brake shoe pad is less than 2 mm (0.079 inch) at any point and the brake shoe pads are assembled with glue, then replace the brake shoes. For riveted brake shoe pads, if the thickness of the brake shoe pad is less than 1 mm (0.039 inch) at any point then replace the brake shoes. Refer to the Service Manual for the replacement procedure of brake shoes.
5. Install the brake drums.
6. Install the tires.

i00767688

Engine Air Filter Primary Element - Clean/Replace

SMCS Code: 1054-070; 1054-510

NOTICE

Never service the air cleaner with the engine running, since this will allow dirt to enter the engine.

Check the air duct for leaks. Make all repairs to leaky air ducts immediately, as dirt and debris could enter the engine causing damage to the turbocharger and engine components.

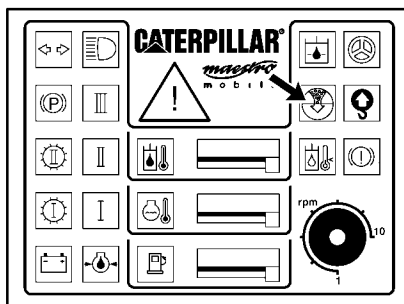


Illustration 321

g00106825

Service the air cleaner if the dash indicator light comes on and the engine is running at high idle. Stop the engine.

A primary element may be cleaned for a maximum of six times. Also replace the primary element if the primary element has been used for one year.

The secondary filter element should also be replaced when any one of the following conditions occurs:

- The primary filter element is serviced for the third time.
- The dash indicator light comes on and the engine is running at high idle after the primary filter element has been serviced.
- The exhaust smoke is black after the primary filter element has been serviced.

See Operation and Maintenance Manual, "Engine Air filter Secondary Element - Replace".

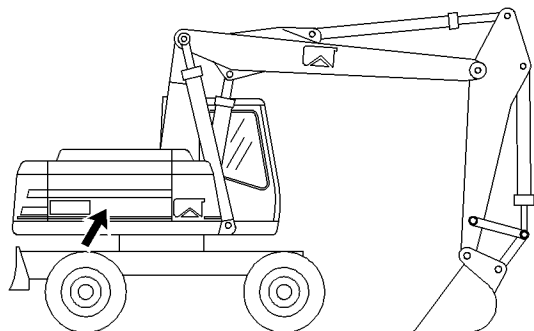


Illustration 322

g00290071

1. In order to access the filter elements, open the access cover on the right side of the machine.



Illustration 323

g00102009

- (1) Rim clamp
- (2) Cover

2. Loosen rim clamp (1). Remove cover (2).

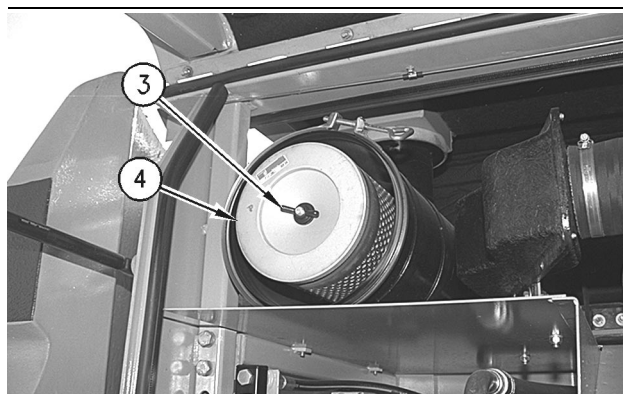


Illustration 324

g00102010

- (3) Wing nut
- (4) Primary filter element

3. Remove wing nut (3). Remove primary filter element (4) from the air cleaner housing.
4. Clean the inside of the air cleaner housing.
5. Inspect the primary element. If the pleats, the gaskets, or the seals are damaged, discard the element. Replace a damaged primary element with a clean primary element.

A primary element may be cleaned for a maximum of six times. Also replace the primary element if the primary element has been used for one year.

NOTICE

Do not clean the filter elements by bumping or tapping them. Do not use filter elements with damaged pleats, gaskets or seals. Engine damage can result.

Make sure the cleaned filter elements are completely dry before installing into the filter housing. Water remaining in the elements can cause false indications of contamination in Scheduled Oil Sampling test results.

6. If the primary element is not damaged, clean the primary element.

The filter elements can be cleaned by using the following methods:

- Pressure air
- Pressure water
- Detergent washing

If you use pressure air, use a maximum air pressure of 205 kPa (30 psi). If you use pressure water, use a maximum water pressure of 280 kPa (40 psi).

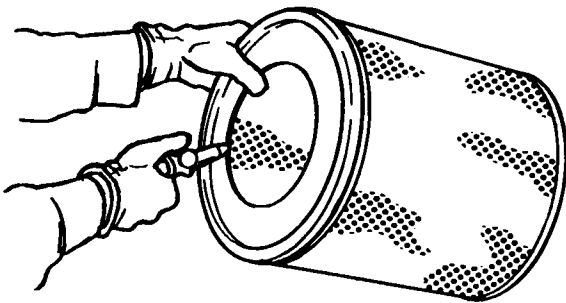


Illustration 325

g00102012

7. When you clean the inside pleats and the outside pleats, direct the air or the water along the pleats.

The element can be washed in a solution that consists of warm water and of nonsudsing household detergent. Fully rinse the pleats. Allow the filter to air dry completely.

8. Inspect the filter elements after you clean the filter elements. Do not use a filter if the pleats, the gaskets or the seals are damaged.
9. Cover the clean filter elements. Store the elements in a clean, dry location.

10. Install a clean primary filter element. Tighten wing nut (3). Use your fingers to tighten wing nut (3). Do not use a tool to tighten the wing nut.

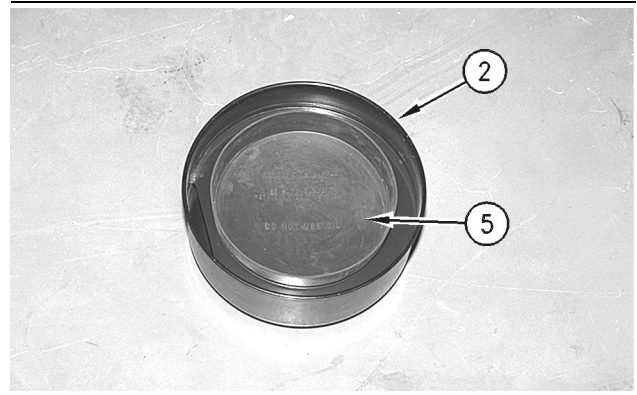


Illustration 326

g00102013

- (2) Cover
(5) Baffle

11. Clean cover (2). Remove baffle (5). Clean the dust from the baffle. Install baffle (5).
12. Install cover (2) so that the "TOP" mark is to the top. Use your fingers to tighten rim clamp (1). Do not use a tool to tighten the rim clamp.
13. Close the access cover.

i00688062

Engine Air Filter Secondary Element - Replace

SMCS Code: 1054-510

NOTICE

Always replace the secondary filter element. Never attempt to reuse the secondary filter element by cleaning the element.

When the primary filter element is cleaned for the third time, the secondary filter element should be replaced.

The secondary filter element should also be replaced if the restricted Air Filter indicator comes on after the installation of a clean primary filter element or if the exhaust smoke is still black.

1. Remove the primary filter element and the cover. See the Operation and Maintenance Manual, "Engine Air Filter Primary Element - Clean/Replace".

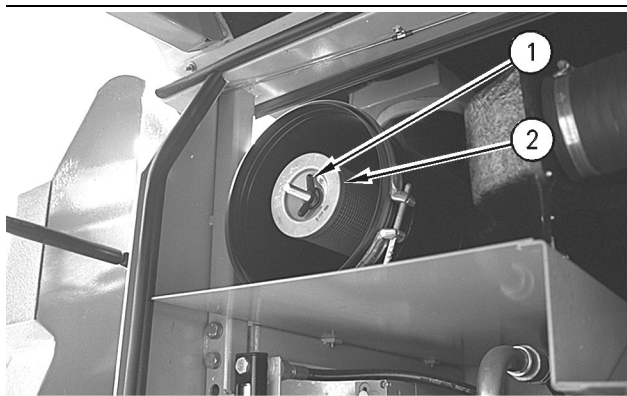


Illustration 327

g00102034

- (1) Wing nut
- (2) Secondary filter element
2. Remove wing nut (1). Remove secondary filter element (2).
3. Cover the air inlet opening. Clean the inside of the air cleaner housing.
4. Uncover the air inlet opening. Install a new secondary element.
5. Tighten wing nut (1) with your fingers. Do not use a tool to tighten wing nut (1).
6. Install the primary filter element and the cover. See Operation and Maintenance Manual, "Engine Air Filter Primary Element - Clean/Replace" for the necessary steps.

i00689187

Engine Crankcase Breather Valve - Replace

SMCS Code: 1317-510

WARNING

Bodily injury can occur from unexpected contact with open cab doors on machines equipped with a fixed cab riser.

To avoid injury, close the cab door before climbing onto the rear of the machine.

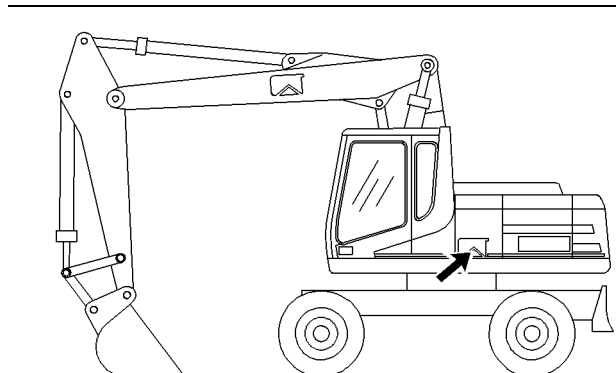


Illustration 328

g00289939

1. Open the access door on the left side of the machine.



Illustration 329

g00102905

2. Open the engine access cover on the top of the machine.

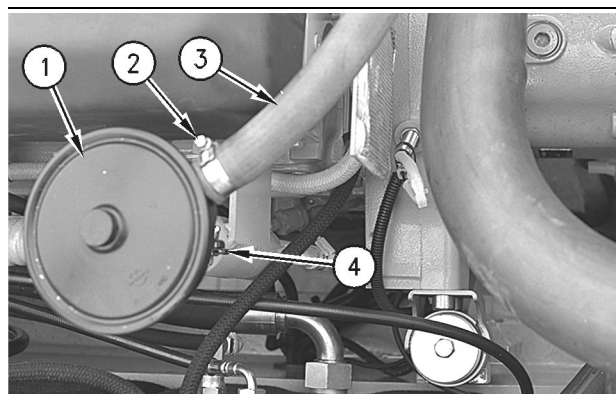


Illustration 330

g00102538

- (1) Breather
- (2) Hose clamp
- (3) Hose
- (4) Rim clamp
3. Loosen hose clamp (2), and remove hose (3) from breather (1).
4. Loosen rim clamp (4) and remove breather (1).

5. Inspect the O-ring seal. If the O-ring seal is damaged, replace the O-ring seal.
6. Install the O-ring seal. Install new breather (1). Connect hose (3) to breather (1). Tighten hose clamp (2) and rim clamp (4).
7. Close the engine access cover and the access door.

i00689192

Engine Governor Oil Supply Screen - Clean/Inspect/Replace

SMCS Code: 1264-040; 1264-070; 1264-510

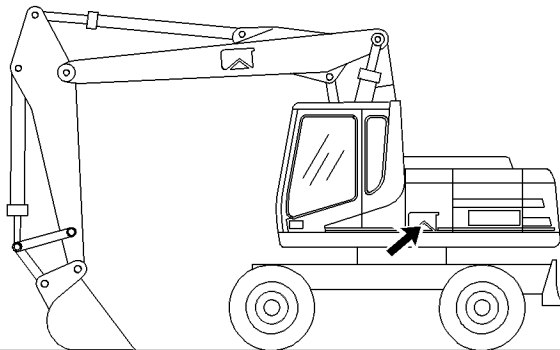


Illustration 331

g00289939

1. Open the access door that is on the left side of the machine. Secure the access door.

WARNING

Bodily injury can occur from unexpected contact with open cab doors on machines equipped with a fixed cab riser.

To avoid injury, close the cab door before climbing onto the rear of the machine.



Illustration 332

g00102905

2. Open the engine access cover that is on the top of the machine.

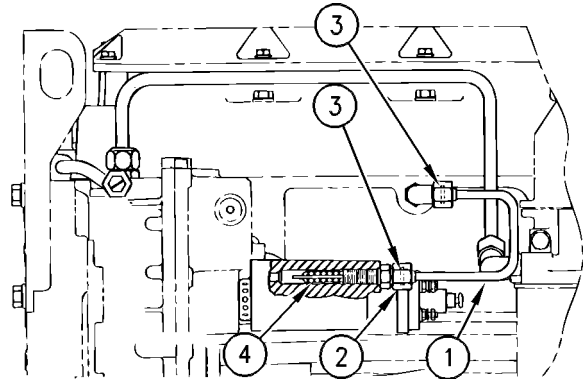


Illustration 333

g00102906

This is a typical example.

- (1) Oil Supply Tube
- (2) Fitting
- (3) Seal
- (4) Screen

3. Remove oil supply tube (1) from the cylinder head. Remove fitting (2) and seal (3) from the governor housing.
4. Remove screen (4). Use a 6 mm hexagon wrench.
5. Wash screen (4) in solvent in order to remove any debris. Inspect screen (4) and seals for damage. If it is necessary, replace the screen or the seals.
6. Install screen (4) in order to allow clearance for fitting (2).
7. Install seals (3), fitting (2), and oil supply tube (1).
8. Close the engine access cover.
9. Close the access door that is on the left side of the machine.

i00689228

Engine Oil Level - Check

SMCS Code: 1000-535

S/N: 6WL1-96

S/N: 8AL1-1032

S/N: 8AL1034-1036

S/N: 6ES1-227

NOTICE

Do not overfill the crankcase. Engine damage can result.

Check the engine oil level while the engine is stopped.

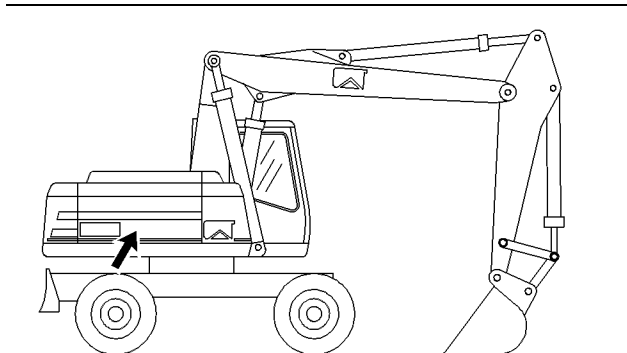


Illustration 334

g00290071

1. Open the access cover that is on the right side of the machine.

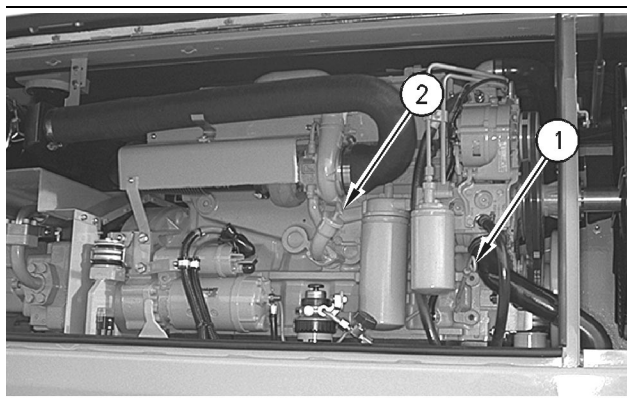


Illustration 335

g00102289

- (1) Dipstick
(2) Oil filler plug

! WARNING

Hot engine components can cause injury from burns. Before performing maintenance on the engine, allow the engine and the components to cool.

2. Remove dipstick (1) in order to measure the oil level.

Oil which is badly contaminated or badly deteriorated should be replaced early. Replace the oil regardless of the time interval.

3. Remove the oil from dipstick (1).
4. Insert dipstick (1). Remove the dipstick again.

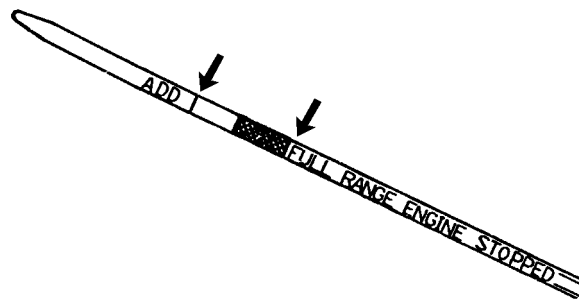


Illustration 336

g00102290

5. Maintain the oil level below the "FULL RANGE" mark on the dipstick and above the "ADD" on the dipstick. If the oil level is low, add oil.

Note: If the oil level is above the "FULL RANGE" mark, operating the engine could cause the crankshaft to dip into the oil. A crankshaft in the oil could lead to excessively high oil temperatures. Excessively high oil temperatures can reduce the lubricating characteristics of the oil. The reduction of lubricating characteristics of the oil causes bearing damage. Bearing damage leads to the loss of engine power.

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" for information on containing fluid spillage.

6. Remove oil filler plug (2) in order to add oil.
7. Add oil, if necessary.
8. Clean oil filler plug (2). Install the oil filler plug.
9. Close the access cover.

i00653127

Engine Oil Level - Check

SMCS Code: 1000-535

S/N: 6WL97-Up

S/N: 8AL1033

S/N: 8AL1037-Up

S/N: 6ES228-Up

S/N: 8SS1-Up

S/N: 9PS1-Up

NOTICE

Do not overfill the crankcase. Engine damage can result.

Check the engine oil level while the engine is stopped.

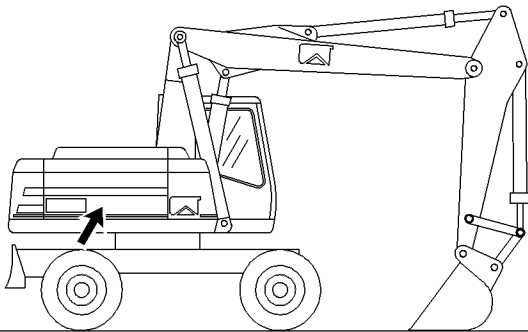


Illustration 337

g00290071

1. Open the access cover that is on the right side of the machine.

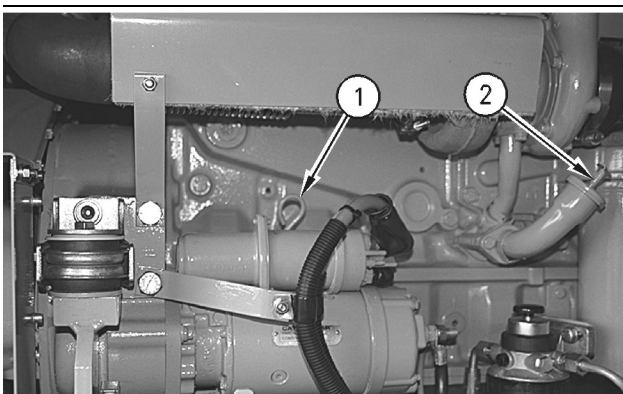


Illustration 338

g00289763

(1) Dipstick. (2) Oil filler plug.

WARNING

Hot engine components can cause injury from burns. Before performing maintenance on the engine, allow the engine and the components to cool.

2. Remove dipstick (1) in order to measure the oil level.

Oil which is badly contaminated or badly deteriorated should be replaced early. Replace the oil regardless of the time interval.

3. Remove the oil from dipstick (1).
4. Insert dipstick (1). Remove the dipstick again.

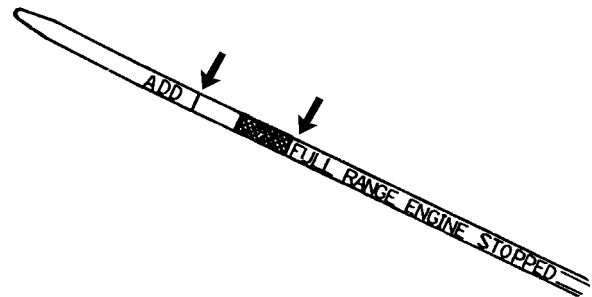


Illustration 339

g00102290

5. Maintain the oil level below the "FULL RANGE" mark on the dipstick and above the "ADD" on the dipstick. If the oil level is low, add oil.

Note: If the oil level is above the "FULL RANGE" mark, operating the engine could cause the crankshaft to dip into the oil. A crankshaft in the oil could lead to excessively high oil temperatures. Excessively high oil temperatures can reduce the lubricating characteristics of the oil. The reduction of lubricating characteristics of the oil causes bearing damage. Bearing damage leads to the loss of engine power.

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" for information on containing fluid spillage.

6. Remove oil filler plug (2) in order to add oil.
7. Add oil, if necessary.
8. Clean oil filler plug (2). Install the oil filler plug.
9. Close the access cover.

i00693744

Engine Oil and Filter - Change

SMCS Code: 1318-510

S/N: 6WL1-96

S/N: 8AL1-1032

S/N: 8AL1034-1036

S/N: 6ES1-227

1. Park the machine on a level surface.
2. Engage the parking brake.
3. Lower the implements to the ground.
4. Stop the engine.

Note: Drain the crankcase while the oil is warm. This allows waste particles that are suspended in the oil to drain. As the oil cools, the waste particles will settle to the bottom of the crankcase. The particles will not be removed by draining the oil and the particles will recirculate in the engine lubrication system with the new oil.

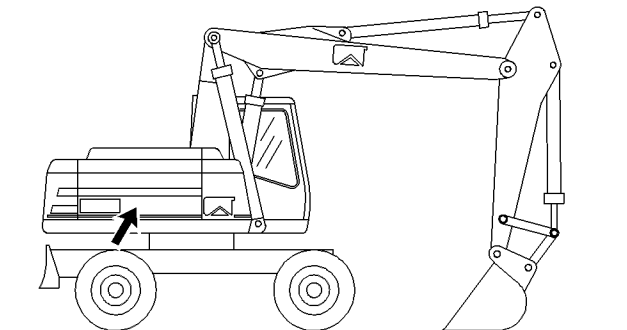


Illustration 340

g00290071

5. Open the access cover that is on the right side of the machine.

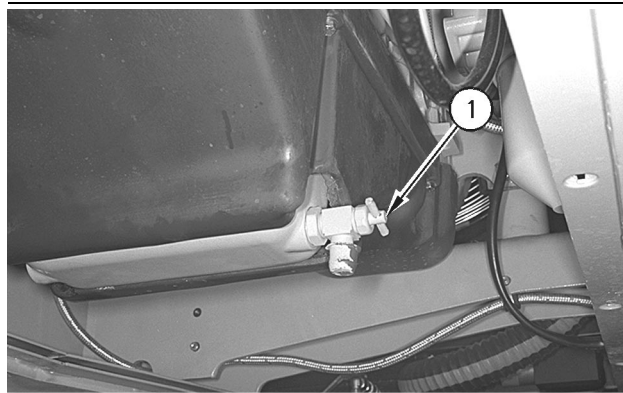


Illustration 341

g00102417

- (1) Crankcase drain valve

6. Remove the cover under crankcase drain valve (1).

Note: Refer to the Operation and Maintenance Manual, "General Hazard Information" for information in containing fluid spillage.

7. Open crankcase drain valve (1). Allow the oil to drain into a suitable container. Close crankcase drain valve (1).

Note: Dispose of drained fluids according to local regulations.

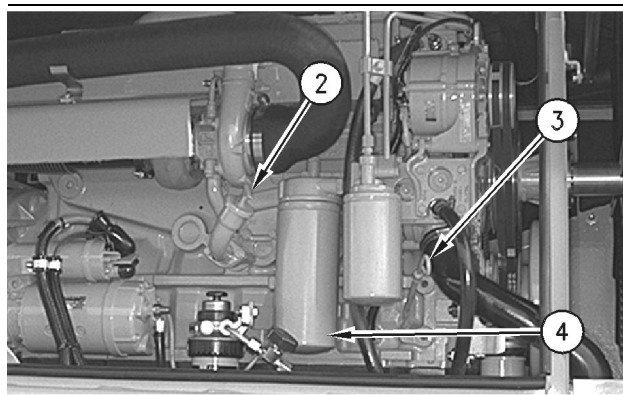


Illustration 342

g00102421

- (2) Oil filler plug
- (3) Dipstick
- (4) Oil filter

WARNING

Hot engine components can cause injury from burns. Before performing maintenance on the engine, allow the engine and the components to cool.

8. Remove used oil filter (4). See Operation and Maintenance Manual, "Oil Filter - Inspect".

9. Clean the filter housing base. Remove all of the old filter gasket.

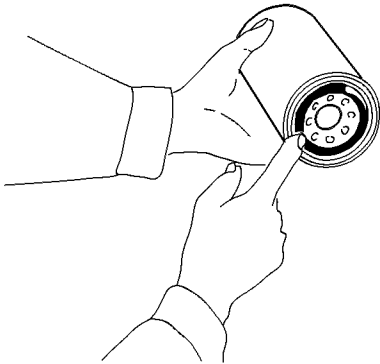


Illustration 343

g00102462

10. Apply a thin coat of engine oil to the gasket of the new filter.
11. Install the new filter by hand. When the gasket contacts the filter base, tighten the filter by an additional 3/4 turn.

Every new oil filter has rotation index marks that are spaced at increments of 1/4 turn. Use the rotation index marks as a guide for tightening the oil filter.

12. Remove oil filler plug (2).

NOTICE

Do not overfill the crankcase. Engine damage can result.

13. Fill the crankcase with new oil.

Note: Refer to the Operation and Maintenance Manual, "Refill Capacities".

14. Clean filler plug (2).
15. Install filler plug (2).
16. Start the engine. Run the engine at low idle for two minutes. Check for oil leaks. Stop the engine.

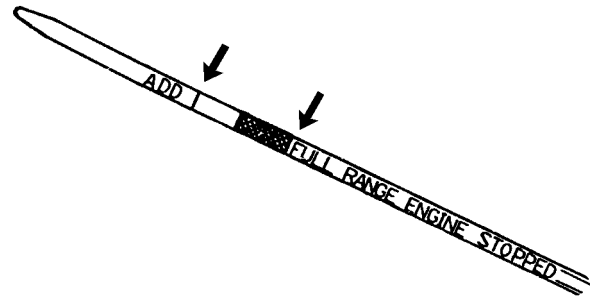


Illustration 344

g00102420

17. Wait for ten minutes in order to allow the oil to drain back into the crankcase. Check the oil level. Maintain the oil level between the "ADD" mark and "FULL" mark on dipstick (3).
18. Install the cover under crankcase drain valve (1).
19. Close the access cover.

i00689780

Engine Oil and Filter - Change

SMCS Code: 1318-510

S/N: 6WL97-Up

S/N: 8AL1033

S/N: 8AL1037-Up

S/N: 6ES228-Up

S/N: 8SS1-Up

S/N: 9PS1-Up

1. Park the machine on a level surface.
2. Engage the parking brake.
3. Lower the implements to the ground.
4. Stop the engine.

Note: Drain the crankcase while the oil is warm. This allows waste particles that are suspended in the oil to drain. As the oil cools, the waste particles will settle to the bottom of the crankcase. The particles will not be removed by draining the oil and the particles will recirculate in the engine lubrication system with the new oil.

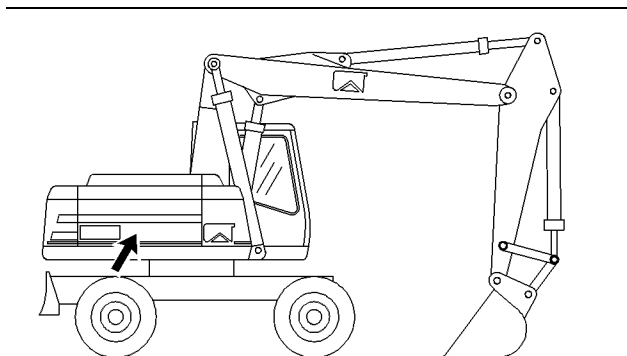


Illustration 345

g00290071

5. Open the access cover that is on the right side of the machine.

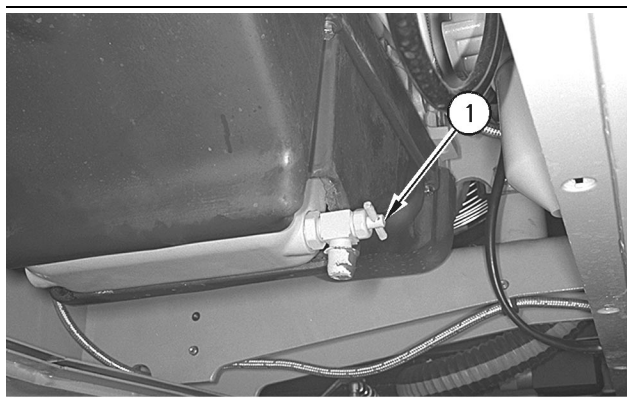


Illustration 346

g00102417

(1) Crankcase drain valve

6. Remove the cover under crankcase drain valve (1).

Note: Refer to the Operation and Maintenance Manual, "General Hazard Information" for information in containing fluid spillage.

7. Open crankcase drain valve (1). Allow the oil to drain into a suitable container. Close crankcase drain valve (1).

Note: Dispose of drained fluids according to local regulations.

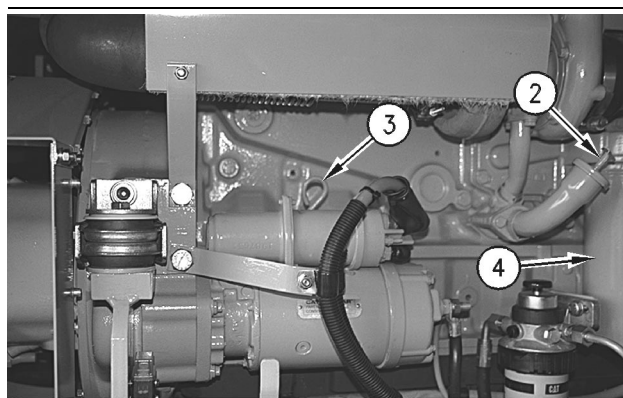


Illustration 347

g00289774

- (2) Oil filler plug
- (3) Dipstick
- (4) Oil filter

WARNING

Hot engine components can cause injury from burns. Before performing maintenance on the engine, allow the engine and the components to cool.

8. Remove used oil filter (4). See Operation and Maintenance Manual, "Oil Filter - Inspect".
9. Clean the filter housing base. Remove all of the old filter gasket.

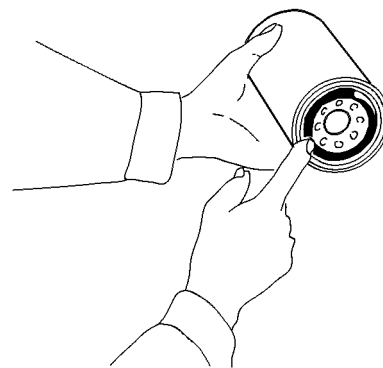


Illustration 348

g00102462

10. Apply a thin coat of engine oil to the gasket of the new filter.
11. Install the new filter by hand. When the gasket contacts the filter base, tighten the filter by an additional 3/4 turn.

Every new oil filter has rotation index marks that are spaced at increments of 1/4 turn. Use the rotation index marks as a guide for tightening the oil filter.

12. Remove oil filler plug (2).

NOTICE

Do not overfill the crankcase. Engine damage can result.

13. Fill the crankcase with new oil.

Note: Refer to the Operation and Maintenance Manual, "Refill Capacities".

14. Clean filler plug (2).

15. Install filler plug (2).

16. Start the engine. Run the engine at low idle for two minutes. Check for oil leaks. Stop the engine.

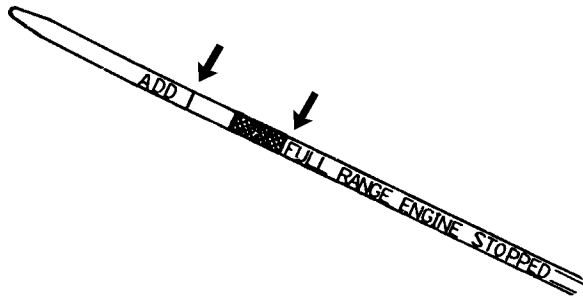


Illustration 349

g00102420

17. Wait for ten minutes in order to allow the oil to drain back into the crankcase. Check the oil level. Maintain the oil level between the "ADD" mark and "FULL" mark on dipstick (3).
18. Install the cover under crankcase drain valve (1).
19. Close the access cover.

i00707053

Engine Valve Lash and Fuel Injector Timing - Check

SMCS Code: 1102; 1105-025; 1105; 1290-531-FT; 1290

Refer to the Service Manual for the complete procedure for checking the engine valve lash. This procedure lists the steps for the engine valve lash adjustment and the steps in order to check the engine valve lash.

Note: Make sure that a qualified mechanic works on the injector fuel timing. Special tools and training are required.

Refer to the Service Manual for the complete procedure for checking the injector fuel timing or for adjusting the injector fuel timing.

Note: The correct fuel timing specification is given on the Engine Information Plate. Fuel timing specifications may differ for distinct engine applications and/or power ratings.

i00693992

Ether Starting Aid Cylinder - Replace (If Equipped)

SMCS Code: 1456-510-CD

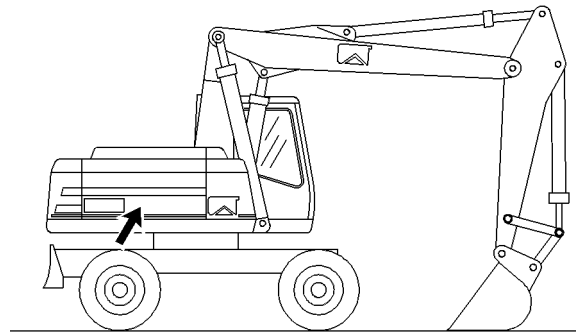


Illustration 350

g00290071

1. Open the access cover on the right side of the machine. The ether starting aid cylinder is mounted toward the rear of the compartment.

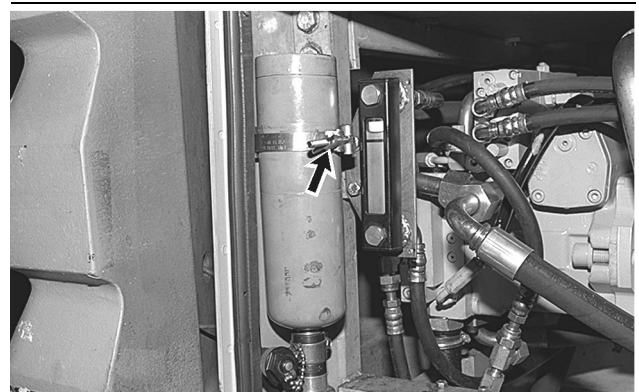


Illustration 351

g00101991

The above illustration shows a typical example of an ether starting aid cylinder.

2. Loosen the cylinder retaining clamp. Unscrew the empty ether starting aid cylinder and remove the empty ether starting aid cylinder.

3. Remove the used gasket. Install the new gasket. A new gasket is provided with each new ether starting aid cylinder.
4. Install the new ether starting aid cylinder. Tighten the ether starting aid cylinder hand tight. Tighten the cylinder retaining clamp securely.
5. Close the access cover.

i00312950

Final Drive Oil - Change

SMCS Code: 4050-044-FLV

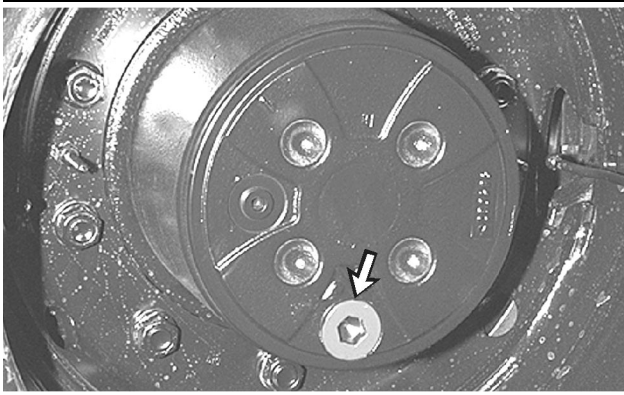


Illustration 352

g00102722

1. Turn the hub until the fill/drain plug is at the lowest position.
2. Remove the dirt that is around the fill/drain plug.

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" for information on containing fluid spillage.

3. Remove the fill/drain plug. Drain the oil into a suitable container.

Note: Dispose of used oil according to local regulations.

4. Turn the hub until the opening of the fill/drain plug is horizontal.
5. Fill the final drive with lubricant to the bottom of the opening of the fill/drain plug. See Operation and Maintenance Manual, "Refill Capacities".
6. Inspect the O-ring seal. If damage or wear is noticed on the O-ring seal, replace the seal.
7. Install the O-ring seal. Install the fill/drain plug.
8. Repeat Steps 1 through 7 for the remaining three axle hubs.

i00703977

Final Drive Oil Level - Check

SMCS Code: 4050-535-FLV

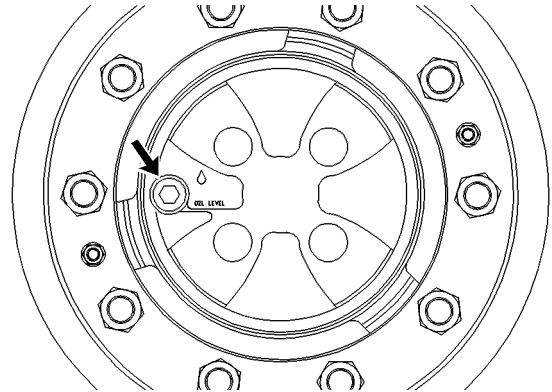


Illustration 353

g00311043

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" for information on containing fluid spillage.

1. Turn the hub until the opening of the fill/drain plug is horizontal, as shown.
2. Remove the dirt that is around the fill/drain plug.
3. Fill the final drive with lubricant to the bottom of the opening of the fill/drain plug. See Operation and Maintenance Manual, "Refill Capacities".
4. Inspect the O-ring seal. If damage or wear is noticed on the O-ring seal, replace the seal.
5. Install the O-ring seal. Install the fill/drain plug.
6. Repeat Steps 1 through 5 for the remaining three axle hubs.

i00694812

Fuel System Primary Filter - Clean/Replace

SMCS Code: 1260-070; 1260-510

S/N: 8AL1-805

WARNING

Personal injury or death can result from a fire.

Fuel leaked or spilled onto hot surfaces or electrical components can cause a fire.

Clean up all leaked or spilled fuel. Do not smoke while working on the fuel system.

Turn the disconnect switch OFF or disconnect the battery when changing fuel filters.

NOTICE

Turn the disconnect switch OFF or disconnect the battery when changing fuel filters.

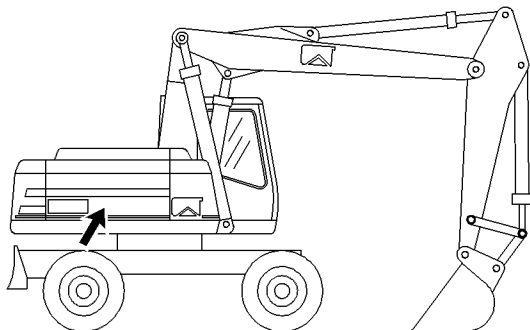


Illustration 354

g00290071

1. Open the access cover on the right side of the machine.

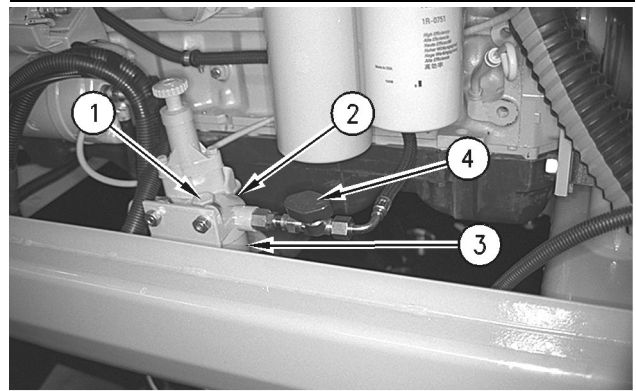


Illustration 355

g00347772

- (1) Bolt
- (2) Filter base
- (3) Case
- (4) Fuel supply valve

2. Close fuel supply valve (4).

3. Loosen bolt (1) on filter base (2).

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" for information in Containing Fluid Spillage.

4. Remove case (3) from filter base (2). Remove the element from case (3).
5. Wash case (3), and wash the element. Use a clean, nonflammable solvent. The case and the element must be dried before use.
6. Inspect the condition of the element. If damage or wear is noticed of the element, replace the element.
7. Clean filter base (2).
8. Install the element into case (3). Install case (3) and the element onto filter base (2).
9. Tighten bolt (1).
10. Open fuel supply valve (4).
11. Refer to Operation and Maintenance Manual, "Fuel System Priming Pump - Operate" for the engine starting procedure to be used after servicing the fuel system.
12. Close the access cover.

i01462342

Fuel System Water Separator Element - Replace

SMCS Code: 1263-510-FQ

S/N: 6WL1-Up

S/N: 8AL806-Up

S/N: 6ES1-Up

S/N: 8SS1-Up

S/N: 9PS1-Up

WARNING

Personal injury or death can result from a fire.

Fuel leaked or spilled onto hot surfaces or electrical components can cause a fire.

Clean up all leaked or spilled fuel. Do not smoke while working on the fuel system.

Turn the disconnect switch OFF or disconnect the battery when changing fuel filters.

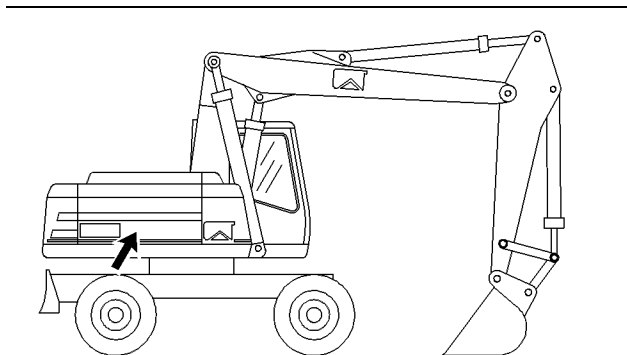


Illustration 356

g00290071

1. Open the access cover on the right side of the machine.

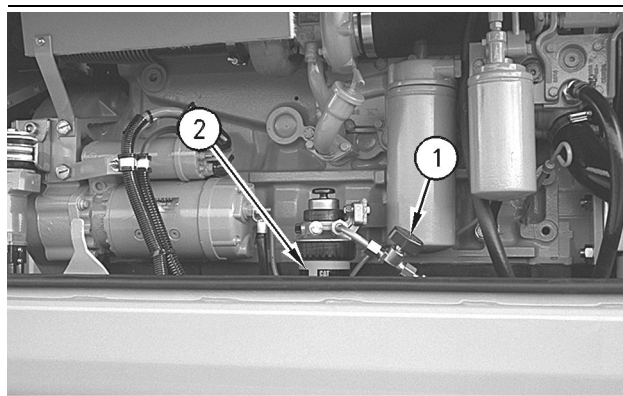


Illustration 357

g00306068

This is a typical example.

- (1) Fuel supply valve
- (2) Primary filter/water separator

2. Close fuel supply valve (1).

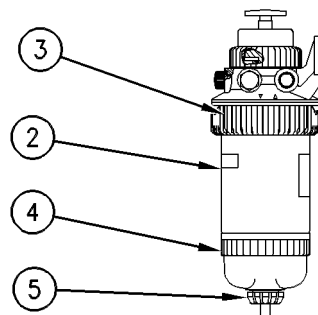


Illustration 358

g00326643

- (2) Primary filter/water separator
- (3) Collar
- (4) Bowl
- (5) Drain valve

3. Turn drain valve (5) counterclockwise in order to open. The drain valve is located at the bottom of the primary filter/water separator.

Note: Refer to the Operation and Maintenance Manual, "General Hazard Information" for information in Containing Fluid Spillage.

4. Drain the water and the sediment into a suitable container.

Note: Obey all local regulations when you discard drained fluids and filters.

5. Close drain valve (5).

6. Hold bowl (4). Remove bowl (4) from the primary filter/water separator.

7. Loosen collar (3).

8. Remove primary filter/water separator (2).
Discard primary filter/water separator (2).
9. Clean the inside surfaces of the filter base and of bowl (4).
10. Inspect the bowl (4). If damage is found, replace the bowl.
11. Inspect the O-ring on the bowl (4). Replace the seal if the O-ring seal is worn or damaged.
12. Install a new primary filter/water separator.
Tighten collar (3) in order to secure the primary filter/water separator.
13. Install bowl (4).
14. Open fuel supply valve (1).
15. Close the access cover on the right side of the machine.

Note: Do not start the engine until all service to the fuel system is complete. For instructions about priming the fuel system, refer to Operation and Maintenance Manual, "Fuel System Priming Pump - Operate".

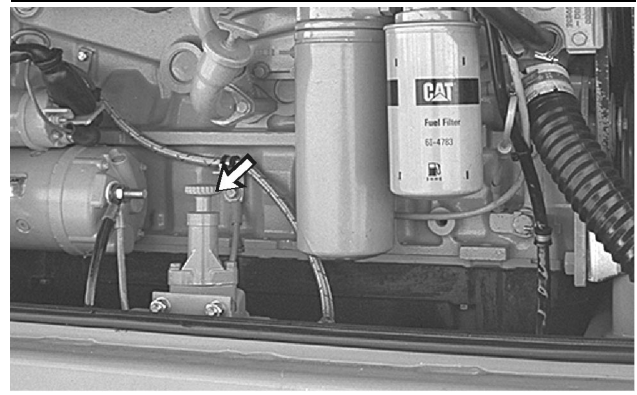


Illustration 360

g00106756

2. Unlock the priming pump plunger. Operate the priming pump plunger until a resistance is felt.
3. Crank the engine. If the engine does not start, or the engine misfires, or the engine emits smoke, then prime the engine again.
4. If the engine starts but the engine runs rough, continue to run the engine at low idle. Run the engine at low idle until the engine runs properly.
5. Check the fuel system for leaks. Stop the engine.
6. Close the access cover.

i00694987

Fuel System Priming Pump - Operate

SMCS Code: 1258

S/N: 8AL1-805

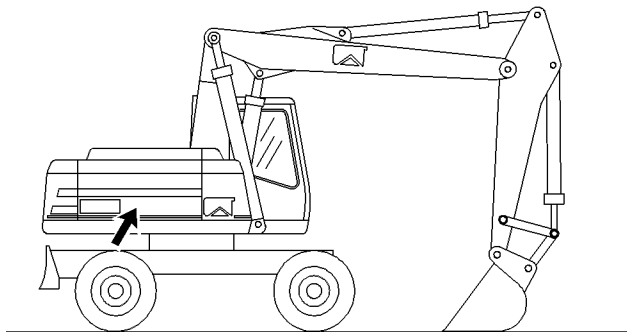


Illustration 359

g00290071

1. Open the access cover on the right side of the machine.

Fuel System Priming Pump - Operate

SMCS Code: 1258

S/N: 6WL1-96

S/N: 8AL806-1032

S/N: 8AL1034-1036

S/N: 6ES1-227

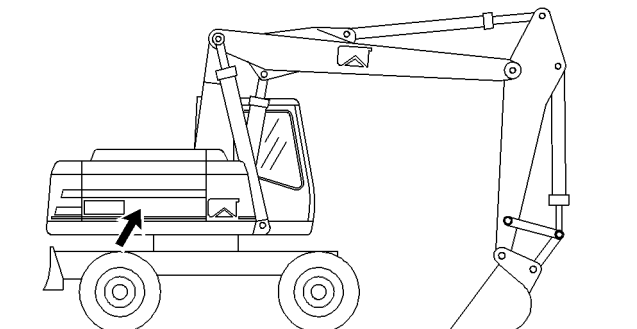


Illustration 361

g00290071

1. Open the access cover on the right side of the machine.

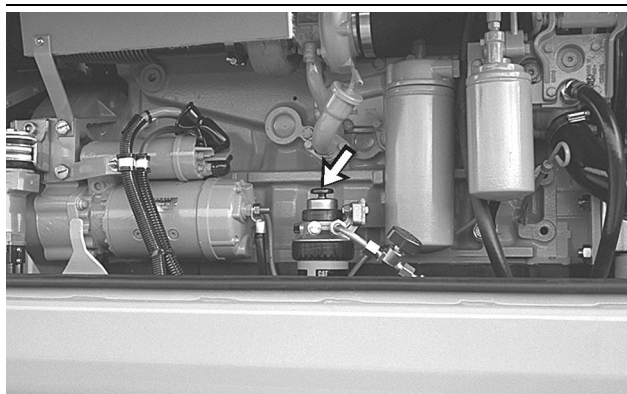


Illustration 362

g00102558

2. Push in the priming pump plunger and release the plunger. Repeat this process several times.
3. Crank the engine. If the engine does not start, or the engine misfires, or the engine emits smoke, then prime the engine again.
4. If the engine starts but the engine runs rough, continue to run the engine at low idle. Run the engine at low idle until the engine runs properly.
5. Check the fuel system for leaks. Stop the engine.
6. Close the access cover.

Fuel System Priming Pump - Operate

i00653135

SMCS Code: 1258

S/N: 6WL97-Up

S/N: 8AL1033

S/N: 8AL1037-Up

S/N: 6ES228-Up

S/N: 8SS1-Up

S/N: 9PS1-Up

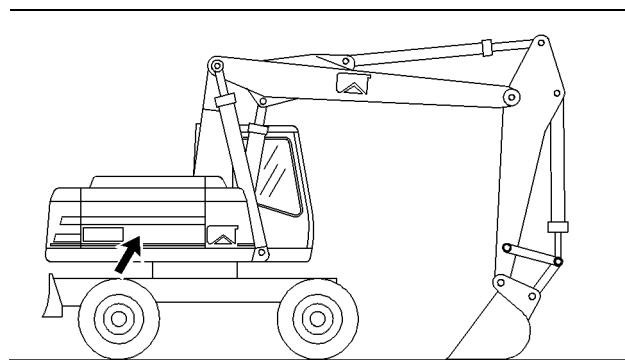


Illustration 363

g00290071

1. Open the access cover that is on the right side of the machine.

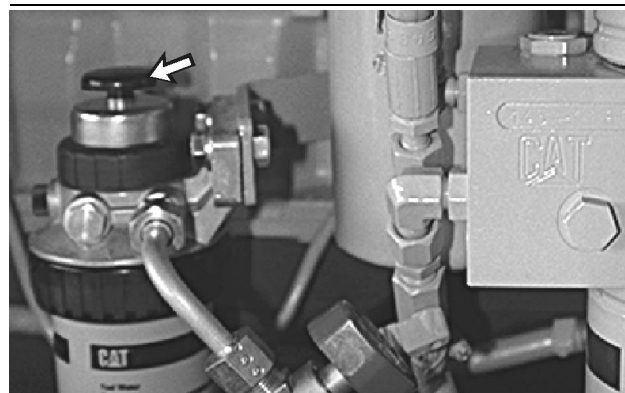


Illustration 364

g00290420

2. Unlock the priming pump plunger. Operate the priming pump plunger until a resistance is felt.
3. Crank the engine.

Priming the pump is required if any of the following problems exist:

- The engine does not start.

- The engine misfires.
 - The engine emits smoke.
4. If the engine starts but the engine runs rough, continue to run the engine at low idle. Run the engine at low idle until the engine runs properly.
 5. Check the fuel system for leaks. Stop the engine.
 6. Close the access cover.

i00695053

Fuel System Secondary Filter - Replace

SMCS Code: 1261-510

S/N: 6WL1-96

S/N: 8AL1-1032

S/N: 8AL1034-1036

S/N: 6ES1-227

WARNING

Personal injury or death can result from a fire.

Fuel leaked or spilled onto hot surfaces or electrical components can cause a fire.

Clean up all leaked or spilled fuel. Do not smoke while working on the fuel system.

Turn the disconnect switch OFF or disconnect the battery when changing fuel filters.

NOTICE

Do not fill fuel filter housings with fuel before installing elements.

Contaminated fuel will cause accelerated wear to fuel system components.

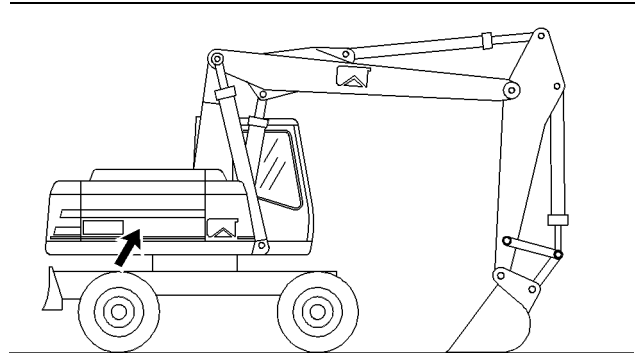


Illustration 365

g00290071

1. Open the access cover on the right side of the machine.

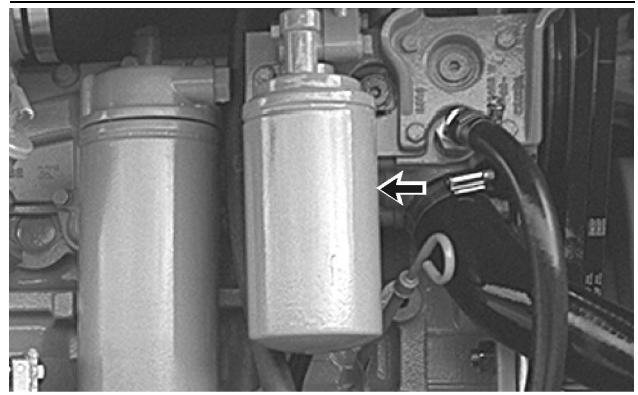


Illustration 366

g00305704

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" for information in Containing Fluid Spillage.

2. Remove the fuel filter. Cut the fuel filter open and check for debris.

Note: The secondary fuel filter is a cartridge type filter. The filter cannot be reused.

Note: Used filters and used fluids should always be disposed of according to established local regulations.

3. Clean the filter mounting base. Ensure that all of the old seal is removed.

i00694975

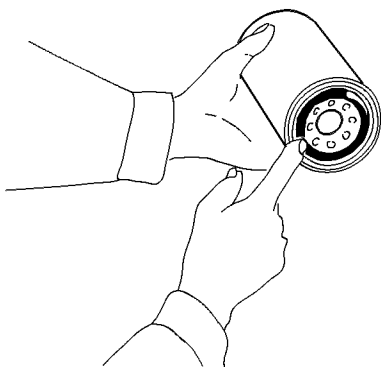


Illustration 367

g00102534

4. Lubricate the seal of a new filter with clean diesel fuel.
5. Install the new filter by hand. Additionally tighten the filters by $\frac{3}{4}$ of a turn, after the gasket contacts the filter base.

There are rotation index marks on the filter. Each mark is $\frac{1}{4}$ turn from the previous mark. Use these marks as a guide for proper tightening.

6. Prime the fuel system. Refer to Operation and Maintenance Manual, "Fuel System Priming Pump - Operate".
7. Close the access cover.

Fuel System Secondary Filter Number One - Replace (Lower Secondary Filter)

SMCS Code: 1261-510-SE

S/N: 6WL97-Up

S/N: 8AL1033

S/N: 8AL1037-Up

S/N: 6ES228-Up

S/N: 8SS1-Up

S/N: 9PS1-Up

WARNING

Personal injury or death can result from a fire.

Fuel leaked or spilled onto hot surfaces or electrical components can cause a fire.

Clean up all leaked or spilled fuel. Do not smoke while working on the fuel system.

Turn the disconnect switch OFF or disconnect the battery when changing fuel filters.

NOTICE

Turn the disconnect switch OFF or disconnect the battery when changing fuel filters.

Do not fill fuel filters with fuel before installing them. Contaminated fuel will cause accelerated wear to fuel systems parts.

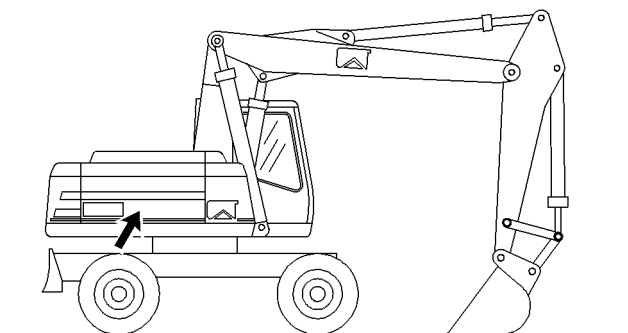


Illustration 368

g00290071

1. Open the access cover that is on the right side of the machine.

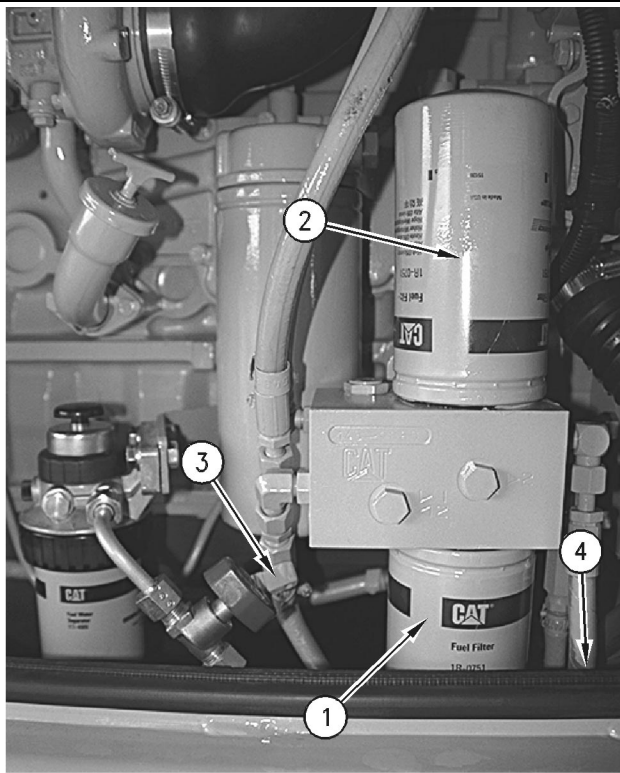


Illustration 369

g00347792

- (1) Lower secondary filter (Secondary filter number one)
- (2) Upper secondary filter (Secondary filter number two)
- (3) Valve
- (4) Valve

Note: Drain upper secondary filter (2) before removing lower secondary filter (1).

2. Turn valves (3) and (4) counterclockwise to the ON position. When the two valves are turned to the ON position, fuel will drain from the filters. The fuel will fall under the machine. Capture the fuel with a suitable container.

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" for information in containing fluid spillage.

3. Slightly loosen upper secondary filter (2). Allow any remaining fuel in the valves to drain into a suitable container. When the fuel stops draining, loosen upper secondary filter (2) more. Continue to loosen and drain the upper secondary filter until the filter is empty.

Note: Dispose of used fluids according to local regulations.

4. Remove lower secondary filter (1). Inspect the fuel filter for debris by cutting the fuel filter open.

Note: This fuel filter is a cartridge type filter. This type of filter cannot be reused.

Note: Dispose of used filters according to local regulations.

5. Clean the filter mounting base. Make sure that all of the used seal is removed.

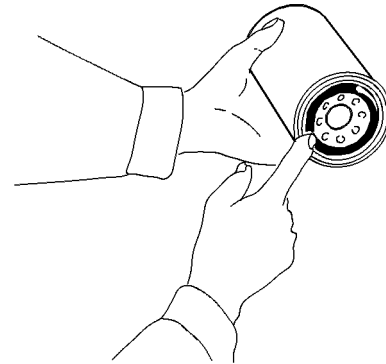


Illustration 370

g00102044

6. Coat the seal of the new filter with clean diesel fuel.

7. Install the new lower secondary filter by hand. When the seal contacts the filter mounting base, tighten the filter by an additional 3/4 turn.

The filter has rotation index marks. Each mark is 1/4 turn from the previous mark. Use these rotation index marks as a guide for proper tightening.

8. Turn valves (3) and (4) clockwise to the OFF position.

9. Tighten upper secondary filter (2) in the same manner that is described in Step 7.

10. Prime the fuel system. Refer to Operation and Maintenance Manual, "Fuel System Priming Pump - Operate" for instructions.

11. Close the access cover.

i00730770

Fuel System Secondary Filter Number Two - Replace (Upper Secondary Filter)

SMCS Code: 1261-510-SE

S/N: 6WL97-Up

S/N: 8AL1033

S/N: 8AL1037-Up

S/N: 6ES228-Up

S/N: 8SS1-Up

S/N: 9PS1-Up

WARNING

Personal injury or death can result from a fire.

Fuel leaked or spilled onto hot surfaces or electrical components can cause a fire.

Clean up all leaked or spilled fuel. Do not smoke while working on the fuel system.

Turn the disconnect switch OFF or disconnect the battery when changing fuel filters.

NOTICE

Do not fill fuel filter housings with fuel before installing elements.

Contaminated fuel will cause accelerated wear to fuel system components.

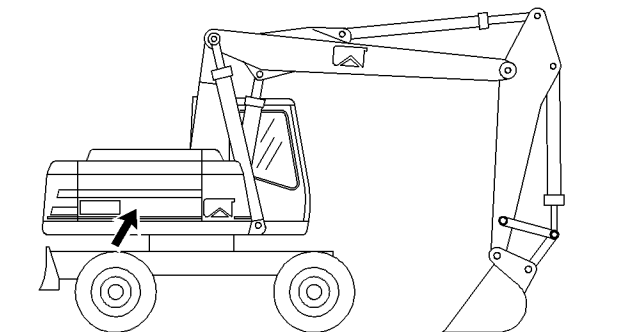


Illustration 371

g00290071

1. Open the access cover that is on the right side of the machine.

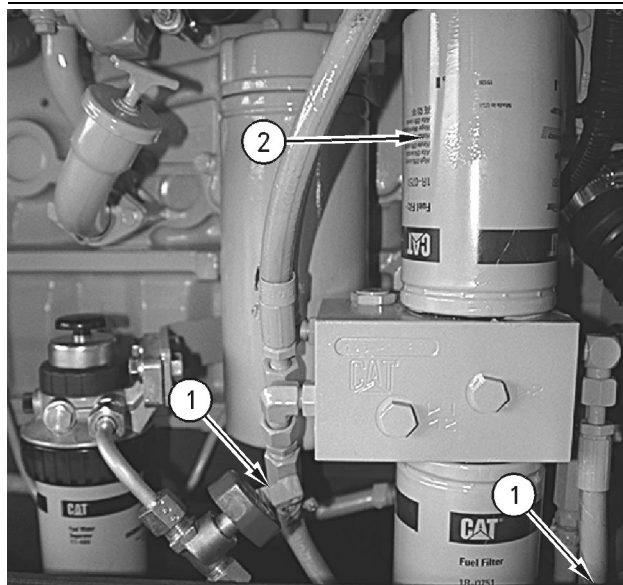


Illustration 372

g00290278

- (1) Valves
(2) Upper secondary filter (Secondary filter number two)

2. Turn two valves (1) counterclockwise to the ON position. When the two valves are turned to the ON position, fuel will drain from the filters. The fuel will fall under the machine. Capture the fuel with a suitable container.

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" for information in containing fluid spillage.

3. Slightly loosen upper secondary filter (2). Allow any remaining fuel in the valves to drain into a suitable container. When the fuel stops draining, loosen upper secondary filter (2) more. Repeat this process until the upper secondary filter is completely drained.

Note: Dispose of used filters and used fluids according to local regulations.

4. Remove the fuel filter. Cut the fuel filter open and check for debris.

Note: The upper secondary fuel filter is a cartridge type filter. The filter cannot be reused.

5. Clean the filter mounting base. Make sure that all of the used seal is removed.

i00695057

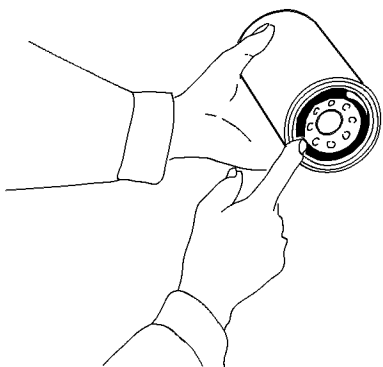


Illustration 373

g00102534

6. Lubricate the seal of the new filter with clean diesel fuel.
7. Install the new filter by hand. Additionally tighten the filter by 3/4 of a turn, after the gasket contacts the filter base.

There are rotation marks on the filter. Each rotation mark is 1/4 turn from the previous mark. Use these marks as a guide for proper tightening.

8. Turn two valves (1) clockwise to the OFF position.
9. Prime the fuel system. Refer to Operation and Maintenance Manual, "Fuel System Priming Pump - Operate".
10. Close the access cover.

Fuel System Water Separator - Drain

SMCS Code: 1263

S/N: 6WL1-Up

S/N: 8AL806-Up

S/N: 6ES1-Up

S/N: 8SS1-Up

S/N: 9PS1-Up

WARNING

Personal injury or death can result from a fire.

Fuel leaked or spilled onto hot surfaces or electrical components can cause a fire.

Clean up all leaked or spilled fuel. Do not smoke while working on the fuel system.

Turn the disconnect switch OFF or disconnect the battery when changing fuel filters.

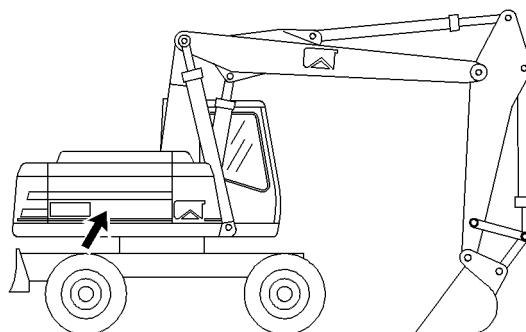


Illustration 374

g00290071

1. Open the access cover on the right side of the machine.

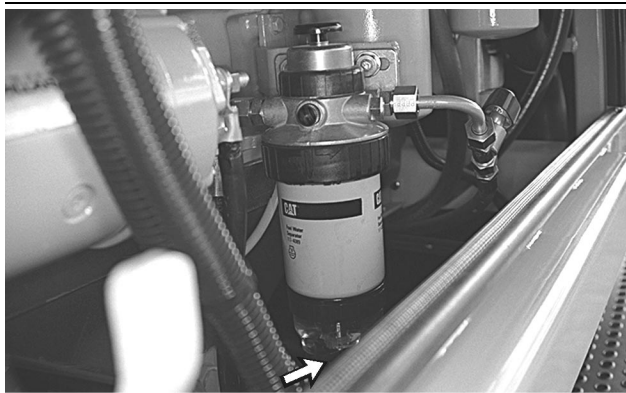


Illustration 375

g00104785

2. Turn the drain valve counterclockwise in order to open. The drain valve is located on the bottom of the water separator and bowl.

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" for information in Containing Fluid Spillage.

3. Drain the water and the sediment into a suitable container.

Note: Drained fluids should always be disposed of according to local regulations.

4. Close the drain valve.
5. Close the access cover.

i00695126

Fuel Tank Cap and Strainer - Clean

SMCS Code: 1273-070-STR

WARNING

Personal injury or death can result from a fire.

Fuel leaked or spilled onto hot surfaces or electrical components can cause a fire.

Clean up all leaked or spilled fuel. Do not smoke while working on the fuel system.

Turn the disconnect switch OFF or disconnect the battery when changing fuel filters.

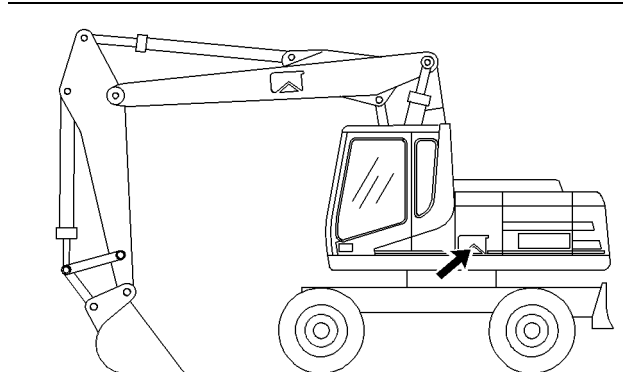


Illustration 376

g00289939

1. Open the access door that is on the left side of the machine. Secure the access door.

WARNING

Bodily injury can occur from unexpected contact with open cab doors on machines equipped with a fixed cab riser.

To avoid injury, close the cab door before climbing onto the rear of the machine.

2. Remove the fuel tank cap and the fuel fill screen.
3. Wash the fuel fill screen and wash the fuel tank cap. Refer to the next two topics.
4. Install the screen into the filler opening.
5. Install the fuel tank cap.
6. Close the access door.

Type 1 Fuel Tank Cap

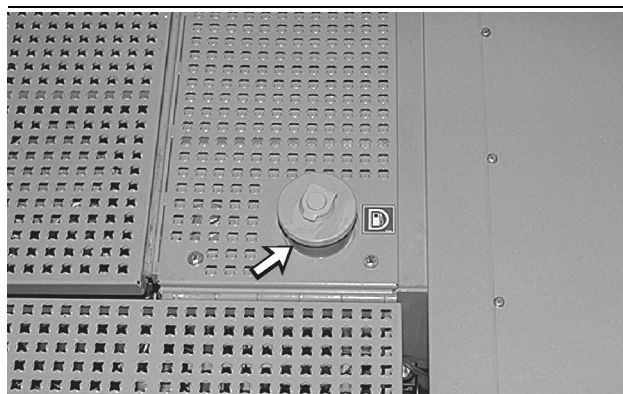


Illustration 377

g00102604

1. Inspect the gasket for damage. Replace the cap if the gasket is damaged.

2. Wash the fuel fill screen and wash the fuel tank cap. Wash these components in a clean, nonflammable solvent.

Type 2 Fuel Tank Cap

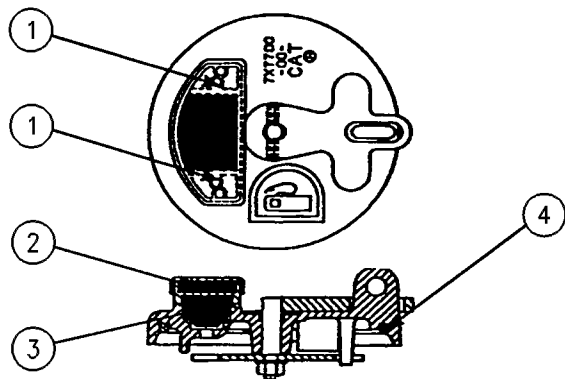


Illustration 378

g00102605

- (1) Screws
(2) Filter Assembly
(3) Valve
(4) Seal

1. Inspect seal (4) for damage. Replace the seal, as needed.
2. Remove the following items: screws (1), filter assembly (2), valve (3), and gaskets.
3. Wash the fuel fill screen and wash the fuel cap. Wash these components in a clean, nonflammable solvent.

i00995193

Fuel Tank Water and Sediment - Drain

SMCS Code: 1273-543

WARNING

Personal injury or death can result from a fire.

Fuel leaked or spilled onto hot surfaces or electrical components can cause a fire.

Clean up all leaked or spilled fuel. Do not smoke while working on the fuel system.

Turn the disconnect switch OFF or disconnect the battery when changing fuel filters.

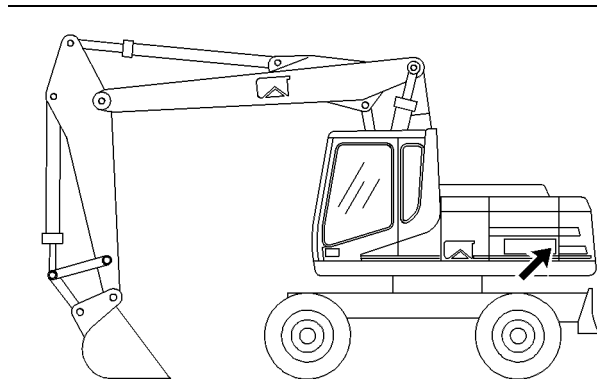


Illustration 379

g00294897

The fuel tank is on the left side of the machine. The drain valve is under the fuel tank.

1. Remove the cover under the fuel tank in order to access the drain valve.



Illustration 380

g00102343

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" for information in Containing Fluid Spillage.

2. Remove the cap that is on the bottom of the drain valve. Open the drain valve in order to drain the water and the sediment. Drain these foreign materials into a suitable container.

Note: Always dispose of drained fluid according to local regulations.

3. Close the drain valve and install the cap. Install the cover over the drain valve.

Fill the Fuel Tank

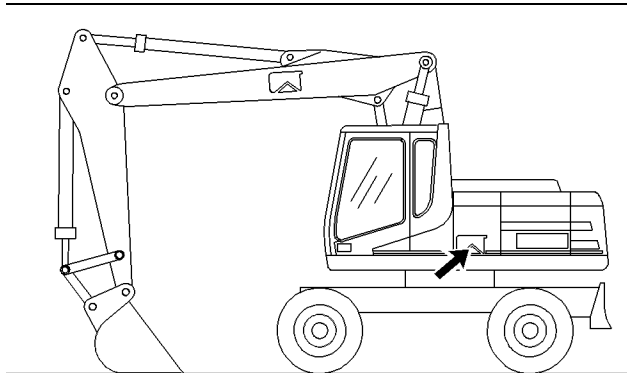


Illustration 381

g00289939

1. Open the access door and secure the access door on the left side of the machine.

WARNING

Bodily injury can occur from unexpected contact with open cab doors on machines equipped with a fixed cab riser.

To avoid injury, close the cab door before climbing onto the rear of the machine.

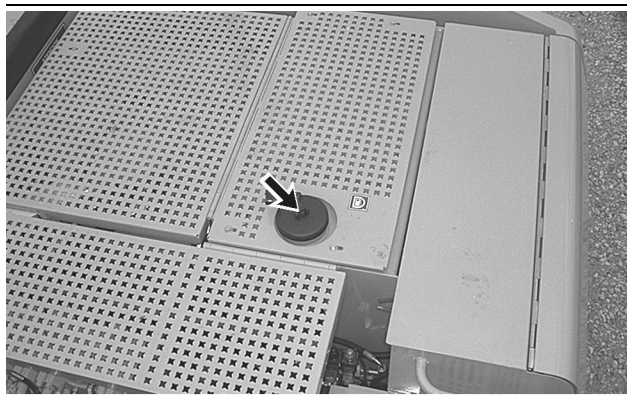


Illustration 382

g00102345

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" for information in Containing Fluid Spillage.

2. To add fuel, remove the fuel filler cap.

Note: Fuel can also be added to the tank by using the electric refueling pump (if equipped). Refer to Operation and Maintenance Manual, "Refueling Pump" for instructions on operating the electric refueling pump.

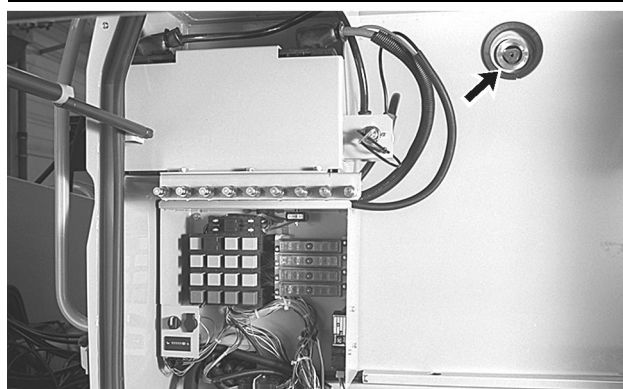


Illustration 383

g00102346

3. Add fuel until the fuel level is in the sight gauge. The sight gauge is located inside the access cover on the left side of the machine.
4. Replace the fuel tank filler cap. To protect against vandalism, lock the fuel filler cap.
5. Close the access door and close the access cover.

i01225602

Fuses - Replace

SMCS Code: 1417-510



Fuses – The fuses protect the electrical system from damage that is caused by overloads. If the element separates, change the fuse. If the element of the new fuse separates, check the circuit and repair the circuit.

NOTICE

Always replace fuses with the same type and capacity fuse that was removed. Otherwise, electrical damage could result.

NOTICE

If it is necessary to replace fuses frequently, an electrical problem may exist.

Contact your Caterpillar dealer.

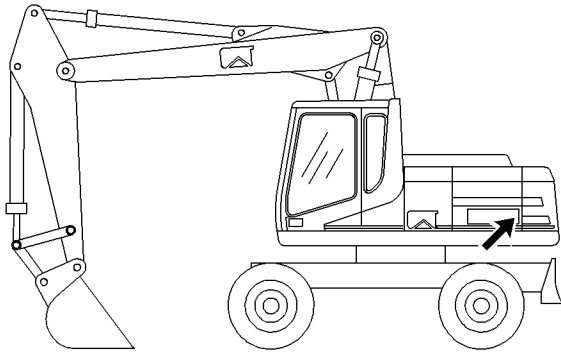


Illustration 384

g00294897

Open the access cover on the left side of the machine.

The following fuses protect the listed circuits. The amperage of each fuse is also listed.

Black Fuse Block

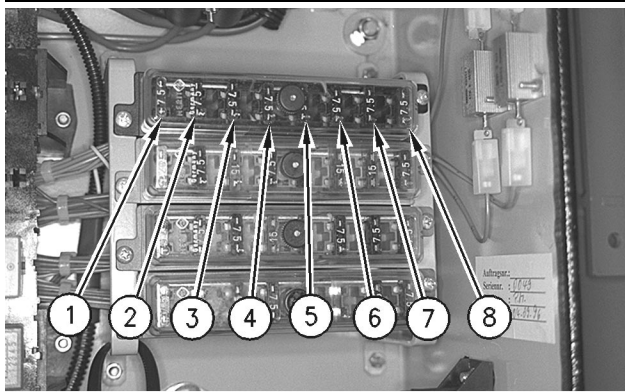


Illustration 385

g00102039

- Right Side Parking Lights (1) – 7.5 Amp
- Left Side Parking Lights (2) – 7.5 Amp
- Instrument Lights (3) – 7.5 Amp
- Right Side Low Beam Lights (4) – 7.5 Amp
- Left Side Low Beam Lights (5) – 7.5 Amp
- Right Side High Beam Lights (6) – 7.5 Amp
- Left Side High Beam Lights (7) – 7.5 Amp
- Control Lights and Turn Signal (8) – 7.5 Amp

Yellow Fuse Block

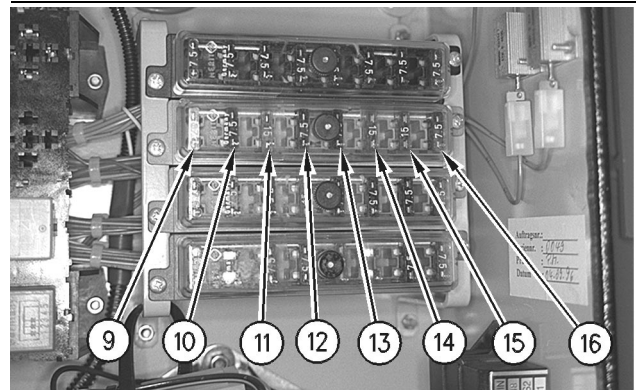


Illustration 386

g00102040

- Electrical Fuel Lift Pump (9) – 25 Amp
- Warning Light and Start/Stop Solenoid (10) – 7.5 Amp
- Engine Start Switch, Main Power Relay and Main Power Light (11) – 15 Amp
- 24 Volt to 12 Volt Converter and Radio (12) – 7.5 Amp
- Start/Stop Relay (13) – 7.5 Amp
- Air Horn Compressor (14) – 15 Amp
- Fan and Ether Starting Aid (15) – 15 Amp
- Lighter, Plug, and Dome Light (16) – 7.5 Amp

Green Fuse Block

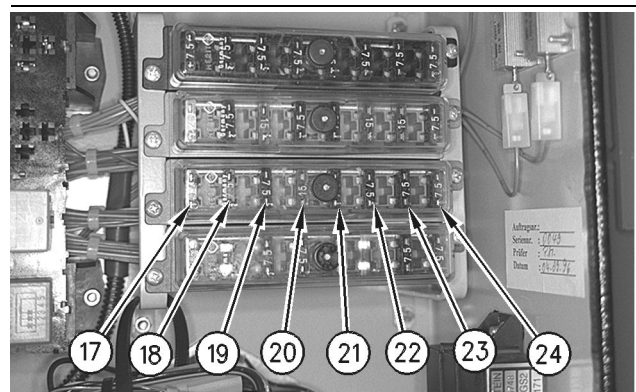


Illustration 387

g00102042

- Backup for Electronic Control (17) – 7.5 Amp
- Power Mode, AEC and Swing Brake (18) – 7.5 Amp
- Individual Stabilizers (19) – 7.5 Amp
- Working Lights (20) – 15 Amp

Adjustment for Impact Hammer Blow Frequency and Flow Control (21) – 7.5 Amp

Electronics (22) – 7.5 Amp

Rotating Beacons (23) – 15 Amp

Pneumatic Operator Seat and Priority (24) – 7.5 Amp

Red Fuse Block

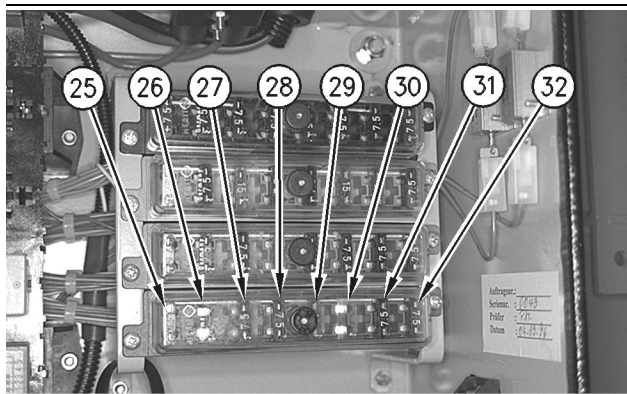


Illustration 388

g00102041

Stop Light (25) – 7.5 Amp

Air Conditioner (26) – 20 Amp

Horn, Overload Buzzer, and Warning of Third Decrease in Pressure (27) – 7.5 Amp

Reverse Steering Warning Light and Travel Alarm (28) – 7.5 Amp

Switch for the Armrest, Swing Gear, Miscellaneous Function, Travel Cutoff Relay, Parking Brake, High/Low Speed, Creeper Speed, Cab Riser and Oscillating Axle Lock (29) – 15 Amp

Supplemental Steering (30) – 7.5 Amp

Upper Windshield Wiper and Pump (31) – 7.5 Amp

Lower Windshield Wiper and Pump (32) – 7.5 Amp

Additional Fuses

Fuse for Main Power

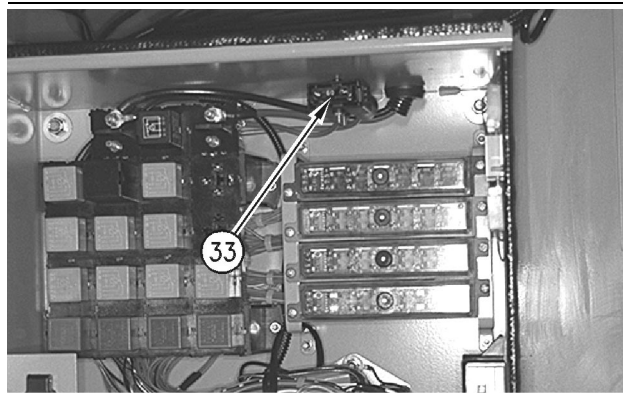


Illustration 389

g00102043

An additional fuse is positioned in the fuse box.

Main Power (33) – 60 Amp

Fuse For Starter Motor And For Alternator

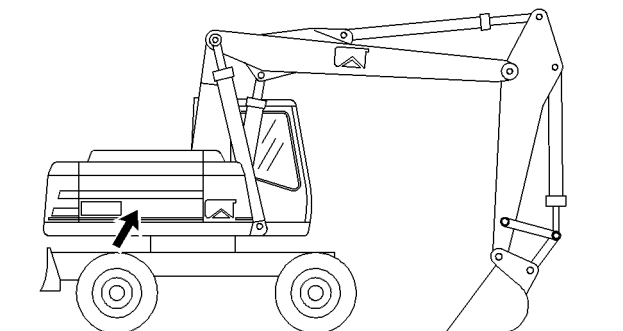


Illustration 390

g00290071

This fuse is located behind the access cover that is on the right side of the machine.

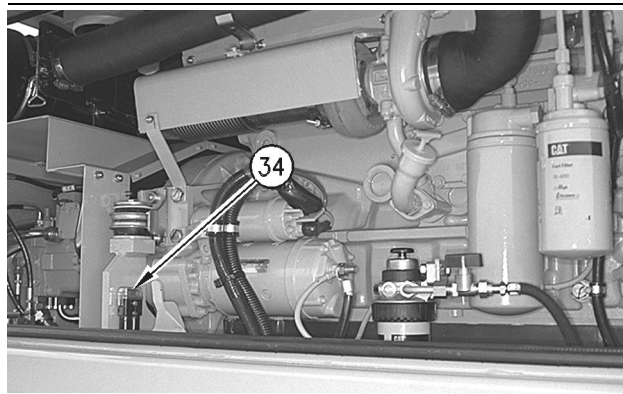


Illustration 391

g00102045

Starter Motor and Alternator (34) – 70 Amp

i00767627

Hydraulic System Oil - Change

SMCS Code: 5056-044

Drain the Oil

1. Operate the machine for an adequate period of time in order to warm the oil.
2. Park the machine on a level surface.
3. Engage the parking brake.
4. Lower the implements to the ground with the stick in a vertical position, as shown.
5. Stop the engine.

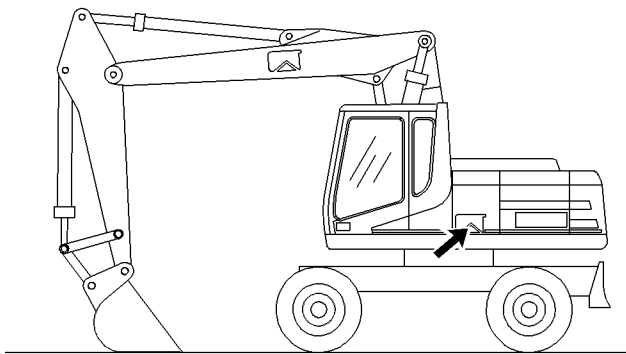


Illustration 392

g00289939

6. Open the access door on the left side of the machine. Secure the access door.

WARNING

Bodily injury can occur from unexpected contact with open cab doors on machines equipped with a fixed cab riser.

To avoid injury, close the cab door before climbing onto the rear of the machine.

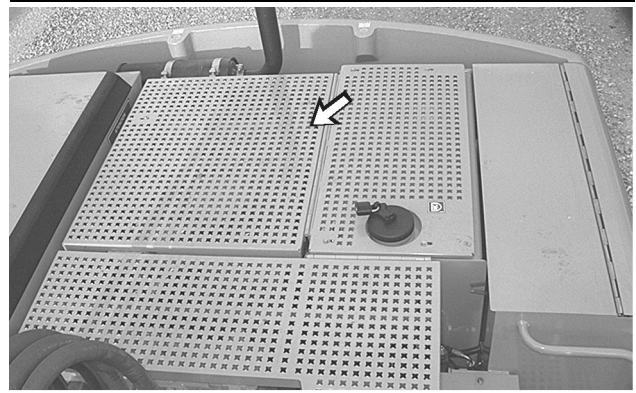


Illustration 393

g00102936

7. Open the access cover on the top of the machine.

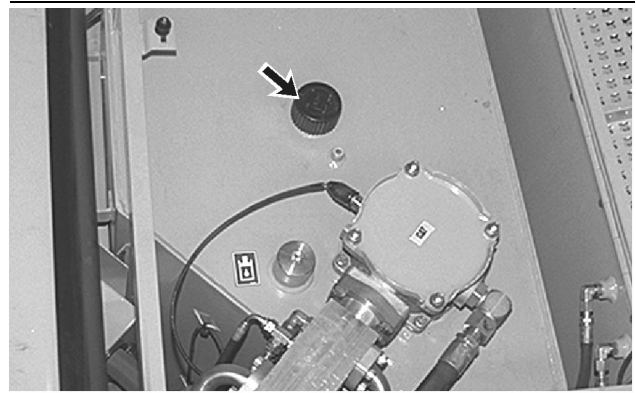


Illustration 394

g00123374

8. Slowly loosen the breather in order to relieve system pressure.
9. Remove the cover under the hydraulic tank.

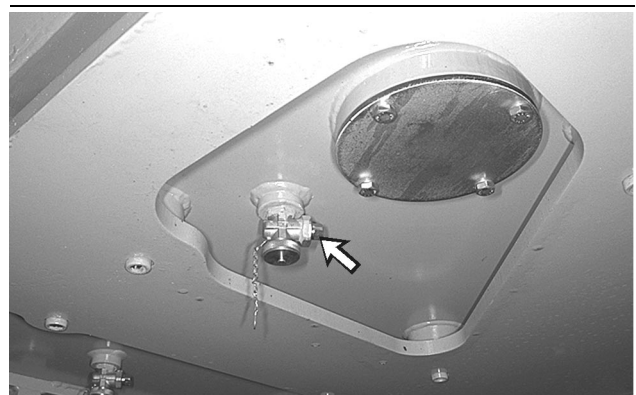


Illustration 395

g00102939

The drain valve is under the middle of the machine.

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" for information in containing fluid spillage.

10. Remove the cap at the bottom of the drain valve. Open the drain valve. Allow the oil to drain into a suitable container.

Note: Dispose of drained fluids according to local regulations.

11. Close the drain valve. Install the cap.

12. Tighten the breather in Step 8.

Service the Hydraulic System Filters

Note: The hydraulic oil system must be empty when the filters are being serviced. Service the filters before refilling the machine with hydraulic oil.

Refer to the following topics in order to service the hydraulic system filters:

- Operation and Maintenance Manual, "Hydraulic System Oil Filter - Clean (Return In-line Filter)"
- Operation and Maintenance Manual, "Hydraulic System Oil Filter - Replace (Hydraulic Swing Circuit Filter)"
- Operation and Maintenance Manual, "Hydraulic System Oil Filter - Replace (Pilot Filter)"
- Operation and Maintenance Manual, "Hydraulic System Oil Filter - Replace (Return Filter)"

Note: All machines have all these filters.

Fill the Hydraulic Tank

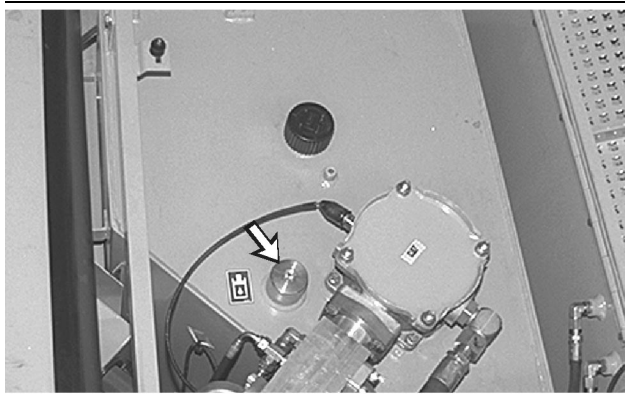


Illustration 396

g00102968

1. Remove the filler plug from the hydraulic tank.
2. Fill the hydraulic oil tank. See Operation and Maintenance Manual, "Refill Capacities".

3. Clean the filler plug. Inspect the O-ring seal. Replace the O-ring seal if the seal is worn or damaged.

4. Install the filler plug.

5. Start the engine. Operate the engine at idling speed for a few minutes.

6. Operate the control levers in order to allow the hydraulic oil to circulate through all hydraulic circuits.

Note: Air may become trapped in the hydraulic system. The pump may cavitate or the machine may move in jerks for several seconds. If these symptoms continue then air is trapped in the hydraulic system. Refer to Testing and Adjusting, SENR6261, "Hydraulic System Pressure - Release" for instructions on releasing the air.

7. Lower the implement to the ground. The stick should be vertical.

8. Stop the engine.

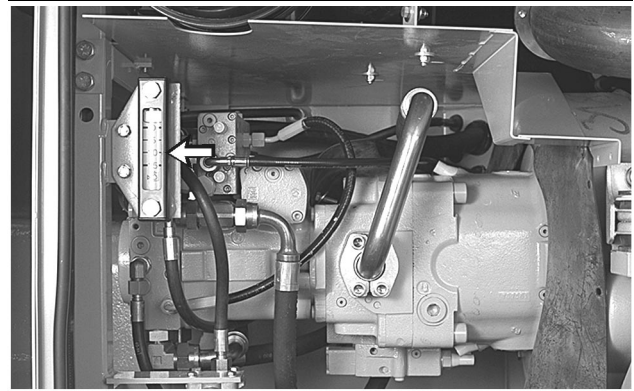


Illustration 397

g00102960

The sight gauge is located in the engine compartment on the right side of the machine.

9. Maintain the oil level to the "0" mark on the sight gauge. The number on the sight gauge indicates the quantity of oil in liters that is needed to fill the tank.

10. Install the cover under the hydraulic tank.

11. Close all access covers and access doors. Secure all access covers and access doors.

i00763691

Hydraulic System Oil Filter - Clean (Return In-line Filters)

SMCS Code: 5068-070

Note: The hydraulic oil system must be empty when the filters are being serviced. Refer to Operation and Maintenance Manual, "Hydraulic System Oil - Change".

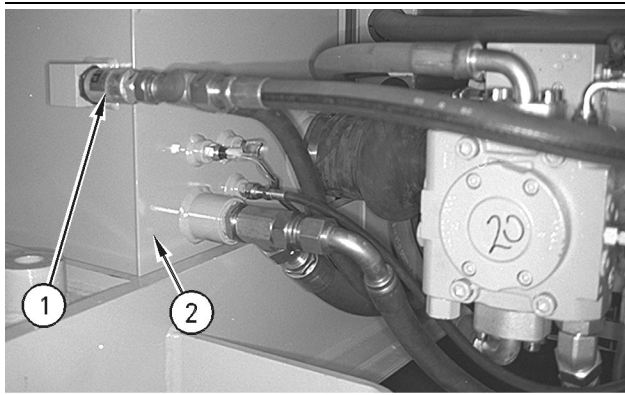


Illustration 398

g00347812

In-line filter (1) is positioned at the right rear of hydraulic tank (2).

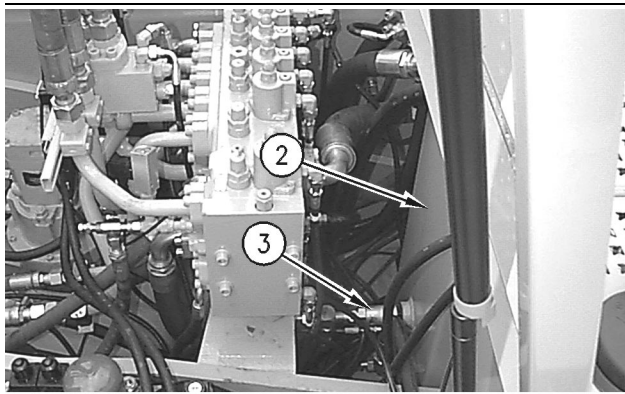


Illustration 399

g00347813

In-line filter (3) is positioned at the front of hydraulic tank (2).

1. Separate the hydraulic lines at in-line filter (1) and at in-line filter (3).
2. Remove the in-line filter from the holders.
3. Wash the in-line filter in a clean, nonflammable solvent. Allow the in-line filter to dry.
4. Clean the holders. Inspect the O-ring seals of the holders. If damage or wear is found, replace the O-ring seals.
5. Install in-line filter (1) and in-line filter (3). Install the in-line filter into the holders.

6. Connect the hydraulic lines.

i00699766

Hydraulic System Oil Filter - Replace (Pilot Filter)

SMCS Code: 5068-510

S/N: 8AL1-1019

S/N: 6ES1-228

Note: The hydraulic oil system must be empty when the filter is being serviced. Refer to Operation and Maintenance Manual, "Hydraulic System Oil - Change".

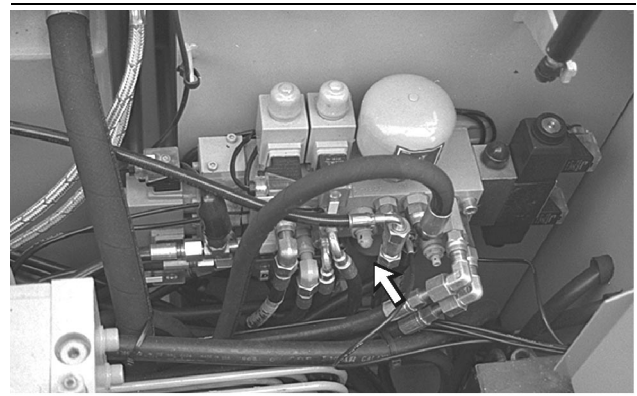


Illustration 400

g00102975

The pilot filter is located under the top access cover, and below the pilot manifold.

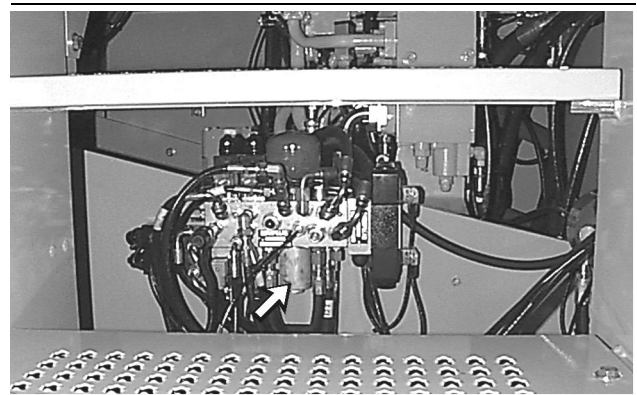


Illustration 401

g00130794

1. Remove the filter housing.
2. Remove the filter element. Discard the filter element.

Note: Dispose of used filter elements according to local regulations.

3. Clean the filter housing.
4. Install a new filter element in the filter housing.
5. Install the filter housing.

i00764233

Hydraulic System Oil Filter - Replace (Hydraulic Swing Circuit Filter)

SMCS Code: 5068-510

Note: The hydraulic oil system must be empty when the filter is being serviced. Refer to Operation and Maintenance Manual, "Hydraulic System Oil - Change".

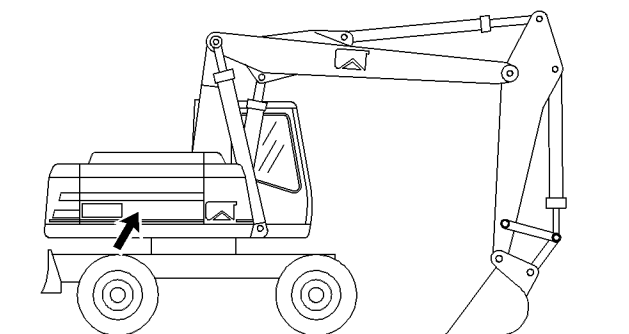


Illustration 402

g00290071

The hydraulic swing circuit filter is in the engine compartment on the right side of the machine.

1. Open the access cover on the right side of the machine.



Illustration 403

g00102976

2. Remove the filter housing.
3. Remove the filter element. Discard the filter element.

Note: Dispose of used filter elements according to local regulations.

4. Clean the filter housing. Inspect the O-ring seal of the filter housing. Replace the seal if the seal is worn or damaged.
5. Install a new filter element in the filter housing.
6. Install the filter housing.
7. Close the access cover on the right side of the machine.

i00763826

Hydraulic System Oil Filter - Replace (Return Filter)

SMCS Code: 5068-510

Note: The hydraulic oil system must be empty when the filter is being serviced. Refer to Operation and Maintenance Manual, "Hydraulic System Oil - Change".

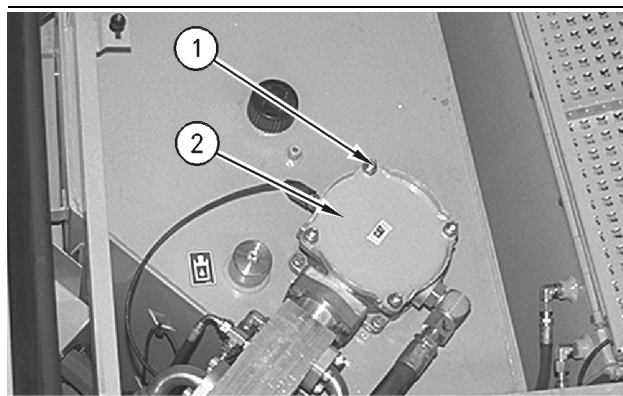


Illustration 404

g00102971

- (1) Nuts
(2) Filter cover

1. Remove four nuts (1) and lock washers. Remove filter cover (2).
2. Remove the filter element. Discard the filter element.

Note: Dispose of used filter elements according to local regulations.

3. Install a new filter element.
4. Clean filter cover (2). Inspect the cover seal. If damage or wear is found, replace the cover seal.

5. Install filter cover (2). Install four lock washers and nuts (1).

i00703730

Hydraulic System Oil Filter - Replace (Pilot Filter)

SMCS Code: 5068-510

S/N: 6WL1-Up

S/N: 8AL1020-Up

S/N: 6ES229-Up

S/N: 8SS1-Up

S/N: 9PS1-Up

Note: The hydraulic oil system must be empty when the filter is being serviced. Refer to Operation and Maintenance Manual, "Hydraulic System Oil - Change".

Note: The pilot filter is located under the operator compartment.

1. Remove the lower access cover.



Illustration 405

g00290375

2. Clean the area in order to prevent dirt from entering the filter base.
3. Remove the used pilot filter element from the filter base.
4. Remove the filter element. Dispose of the used filter element.

Note: Dispose of used filter elements according to local regulations.

5. Clean the filter base.

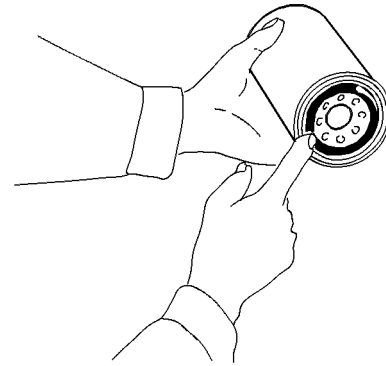


Illustration 406

g00101502

6. Install the new filter by hand. When the gasket contacts the filter base, tighten the filter by an additional 3/4 turn.

Every new oil filter has rotation index marks that are spaced at 1/4 turn. Use the rotation index marks as a guide for tightening the oil filter.

7. Install the lower access cover.

i00699726

Hydraulic System Oil Level - Check

SMCS Code: 5050-535

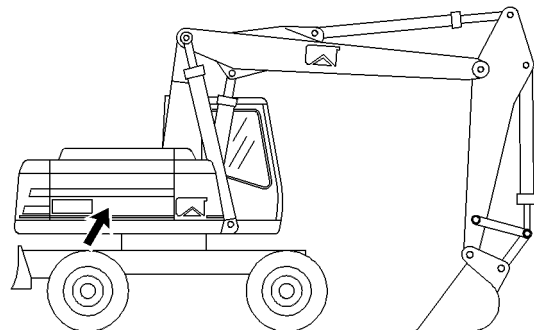


Illustration 407

g00290071

1. Open the access cover that is on the right side of the machine.
2. Lower the dozer (if equipped) and stabilizers (if equipped) to the ground.
3. Place the stick in the vertical position. Place the bucket on the ground. This position is shown in Illustration 407.

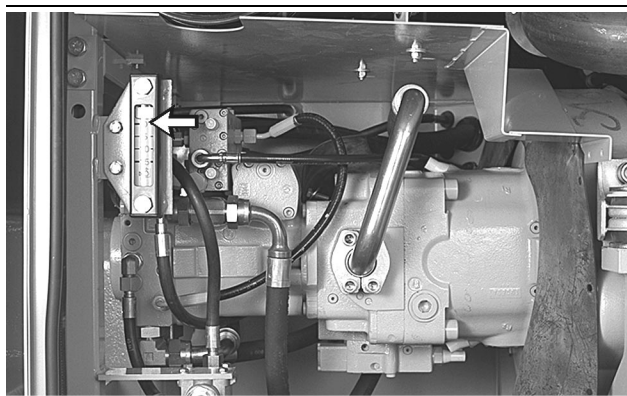


Illustration 408

g00102300

4. Maintain the oil level to the "0" mark on the sight gauge. The numbers on the sight gauge indicate the number of liters of oil that must be added in order to fill the system.

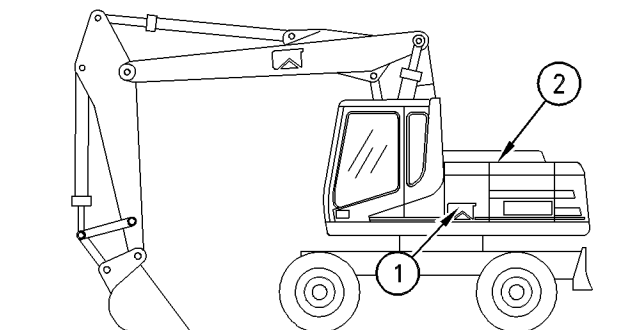


Illustration 409

g00290119

- (1) Access door
- (2) Top access cover

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" for information in Containing Fluid Spillage.

5. If the system needs oil, add the necessary amount of oil. Open access door (1). Secure access door (1). Open access cover (2) on the top of the machine.

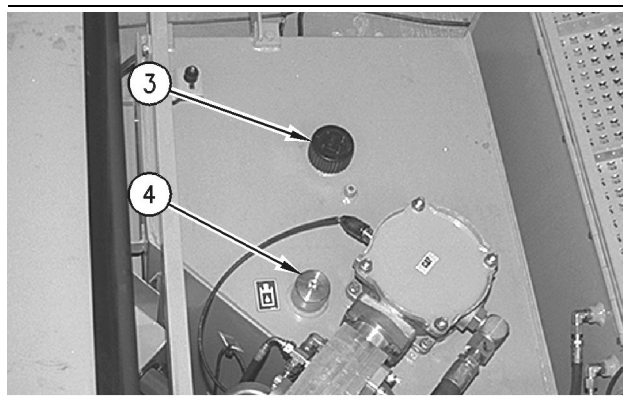


Illustration 410

g00102302

- (3) Breather
- (4) Filler plug
6. Slowly loosen breather (3) in order to relieve the system pressure. Remove filler plug (4). Add the oil through the filler tube.
7. Clean filler plug (3). Install the filler plug. Replace the seal O-ring if the O-ring is worn or damaged.
8. Tighten breather (3).
9. Close the access covers and the access door.

i00052234

Oil Filter - Inspect

SMCS Code: 1308-507; 5068-507

Inspect A Used Filter for Debris

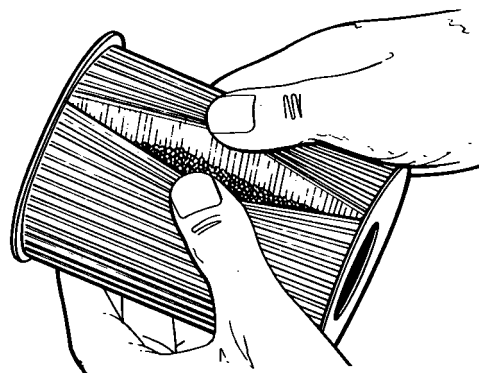


Illustration 411

g00100013

The element is shown with debris.

Use a **4C-5084** Filter Cutter to cut the filter element open. Spread apart the pleats and inspect the element for metal and for other debris. An excessive amount of debris in the filter element can indicate a possible failure.

If metals are found in the filter element, a magnet can be used to differentiate between ferrous metals and nonferrous metals.

Ferrous metals can indicate wear on steel parts and on cast iron parts.

Nonferrous metals can indicate wear on the aluminum parts of the engine such as main bearings, rod bearings, or turbocharger bearings.

Small amounts of debris may be found in the filter element. This could be caused by friction and by normal wear. Consult your Caterpillar dealer in order to arrange for further analysis if an excessive amount of debris is found.

Using an oil filter element that is not recommended by Caterpillar can result in severe engine damage to engine bearings, to the crankshaft, and to other parts. This can result in larger particles in unfiltered oil. The particles could enter the lubricating system and the particles could cause damage.

i00699883

Overhead Guard - Inspect (If Equipped)

SMCS Code: 7159-040

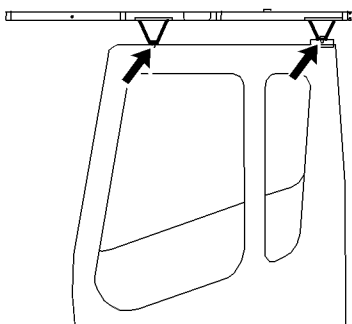


Illustration 412

g00102876

1. Inspect the overhead guard for any bolts that are loose or damaged. Replace bolts that are damaged or missing. Use original equipment parts only. Tighten the bolts.

Note: Apply oil to all the bolt threads before you install the bolts. Failure to oil the threads can cause improper bolt torque.

2. If the overhead guard rattles during machine operation or if the overhead guard makes noises during machine operation, replace the mounting supports for the overhead guard.

Do not repair the overhead guard by welding reinforcement plates to the overhead guard.

Consult your Caterpillar dealer for repair of cracks in the welds on the overhead guard. Consult your Caterpillar dealer for repair of cracks in any metal section of the overhead guard.

i01220682

Radiator Core - Clean

SMCS Code: 1353-070

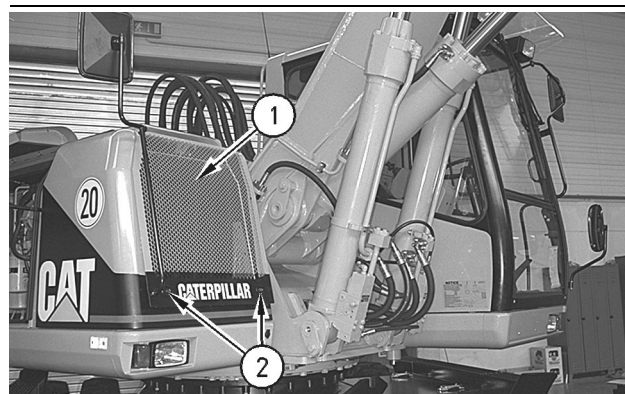


Illustration 413

g00379606

- (1) Standard radiator access cover
(2) Hex head screw

1. Remove foreign material from the radiator access cover (1).
2. Unlock the two hex head screws (2) and rotate up the radiator access cover (1).

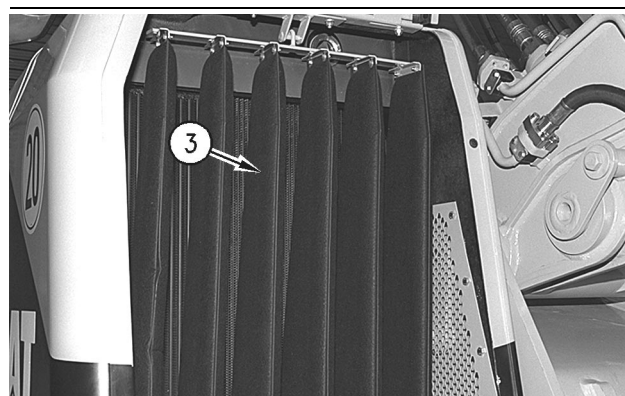


Illustration 414

g00652861

- (3) Baffles

3. Remove baffles (3).

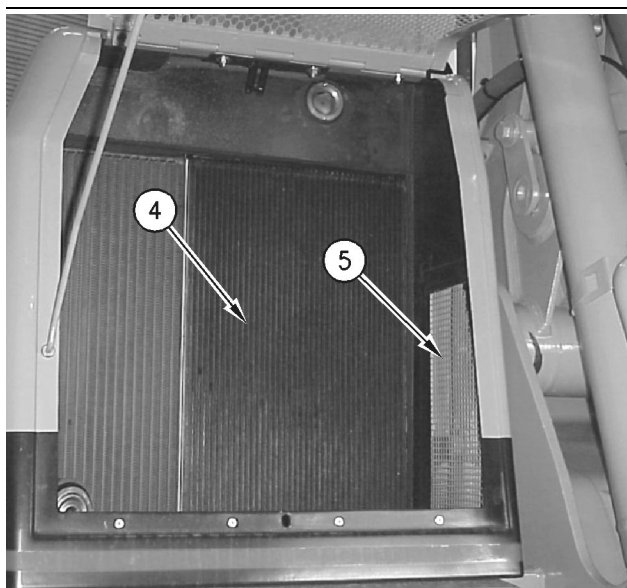


Illustration 415

g00652838

4. Check radiator fins (4) and screen (5) for debris.
5. Remove foreign material from the radiator fins (4) and from screen (5).

Note: To remove dust from a radiator and debris from a radiator, compressed air is preferred. High pressure water can be used and steam can also be used. Clean the radiator, as needed.

See Special Publication, SEBD0518, "Know Your Cooling System" for detailed information on cleaning the radiator fins.

Enclosure for Radiator (If Equipped)

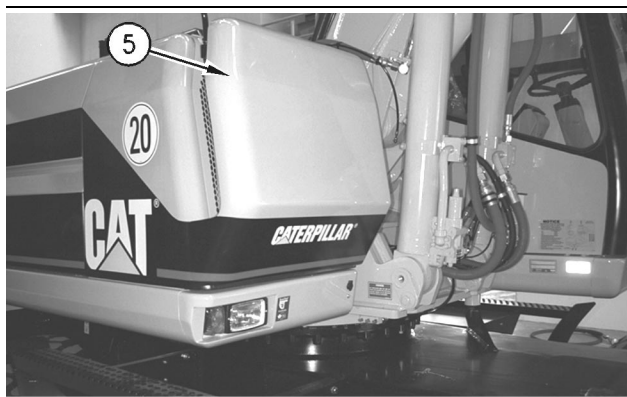


Illustration 416

g00378632

(5) Sound Suppression Cover

If the machine has a sound suppression cover (5), it may not be possible to easily access the radiator core. If it is not possible to access the radiator core, then refer to step 2.

Note: The sound suppression cover (5) will rotate with the radiator access cover (1).

i00688010

Refueling Pump Strainer - Clean (If Equipped)

SMCS Code: 1295-070-STR

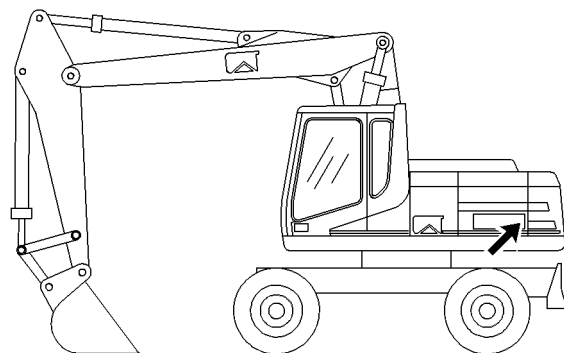


Illustration 417

g00294897

1. Open the access cover on the left side of the machine.

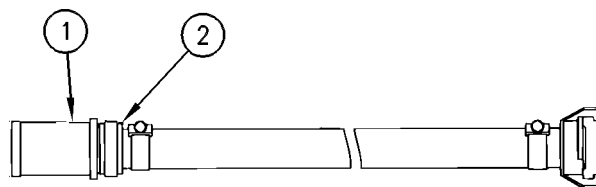


Illustration 418

g00102274

- (1) Screen
(2) Coupling

2. Remove screen (1) from coupling (2).

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" for information in containing fluid spillage.

3. Wash screen (2) in a clean, nonflammable solvent. Dry the screen.
4. Install the screen to coupling (2).
5. Close the access cover.

i00060103

Seat Belt - Inspect

SMCS Code: 7327-040

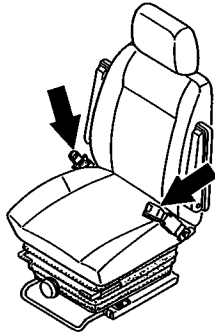


Illustration 419

g00102359

When this machine was shipped from Caterpillar, Inc., this machine was equipped with a seat belt and with a seat belt installation. At the time of installation, the seat belt and the seat belt installation met "SAE J386 JUN85" for an industrial machine and "SAE J386 JUN93". Consult your Caterpillar dealer for all replacement parts.

Replace the seat belt after three year of usage regardless of appearance.

The seat belt and the mounting hardware must be inspected for wear and for damage before operating the machine. Replace the belt or the mounting hardware if wear or damage is found.

i00731002

Seat Belt - Replace

SMCS Code: 7327-510

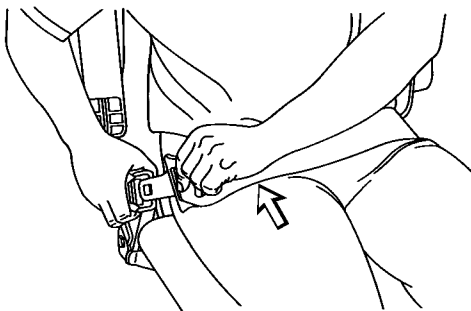


Illustration 420

g00037721

Regardless of the appearance, replace the seat belt once during every three year interval.

i00699946

Stabilizer Bearings - Lubricate (If Equipped)

SMCS Code: 7222-086-BD

Wipe all fittings before you apply the grease.

Note: Perform the following procedure for each stabilizer.

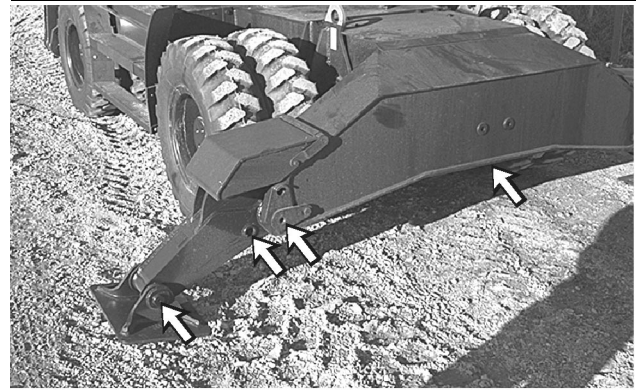


Illustration 421

g00102409

Apply lubricant to the one fitting that is on the pin for the stabilizer pad.

Apply lubricant to one fitting that is on the pin for the stabilizer arm.

Apply lubricant to the fitting that is on the rod end of the stabilizer cylinder.

Apply lubricant to the fitting on the pin at the head end of the stabilizer cylinder.

i00060418

Swing Bearing - Lubricate

SMCS Code: 7063-086

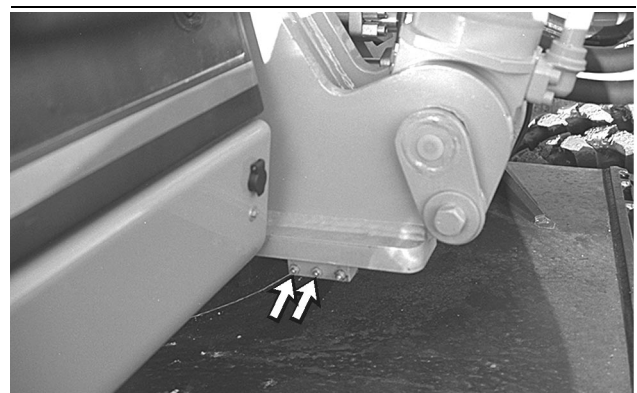


Illustration 422

g00102507

Apply grease to the two rearward fittings that are positioned by the head end of the right boom cylinder. Apply grease to the fitting until the grease overflows the bearing seal.

i00700542

Swing Gear - Lubricate

SMCS Code: 7063-086

S/N: 8AL1-1019

S/N: 6ES1-228

NOTICE

Improper lubrication can cause damage to machine components.

To avoid damage, make sure that the proper amount of grease is applied to the swing drive.

When the amount of grease in the compartment becomes too large, the agitation loss becomes large, thereby accelerating grease deterioration.

Grease deterioration can cause damage to the pinion gear of the swing drive and swing internal gear.

Not enough grease will result in poor gear lubrication.

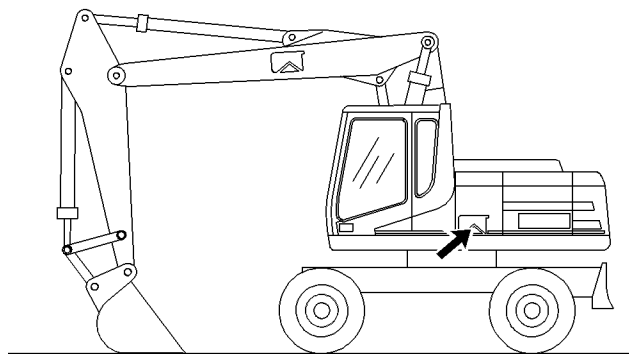


Illustration 423

g00289939

1. Open the access door that is on the left side of the machine. Secure the access door.

WARNING

Bodily injury can occur from unexpected contact with open cab doors on machines equipped with a fixed cab riser.

To avoid injury, close the cab door before climbing onto the rear of the machine.

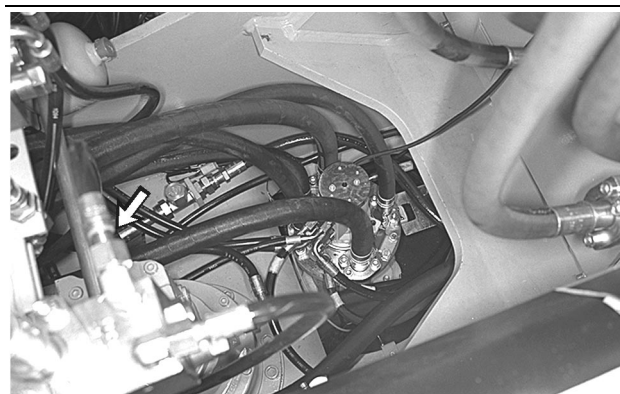


Illustration 424

g00102746

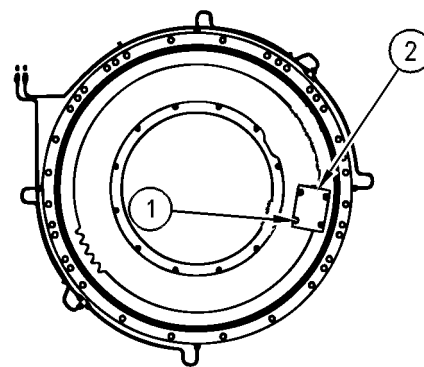


Illustration 425

g00102747

- (1) Bolts
(2) Strip

2. Strip (2) is positioned by the swing motor. Remove bolts (1) and bumper springs. Also remove strip (2) and the gasket.
3. Inspect the gasket. Replace the gasket if the gasket is damaged.
4. Check the level of grease. The grease should be evenly distributed on the floor of the pan.

Note: Add grease, as needed. Remove grease, as needed. Too much grease will result in the deterioration of the grease because of excessive movement of the grease. Too little grease will result in poor lubrication of the swing gear.

5. Check for contamination and for discolored grease.

i00995226

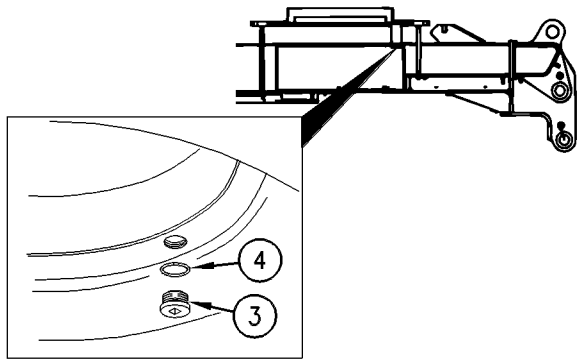


Illustration 426

g00309143

Cross section through undercarriage at swing bearing from the front of the machine

- (3) Plug
(4) O-ring seal

6. If the grease is contaminated or if the grease discolored with water, replace the grease. Remove plug (3). Allow the water to drain. When you install plug (3), inspect the O-ring seal (4). Replace the O-ring seal if the seal is damaged.
7. Raise the boom. Turn the upper structure for 1/12 turn. This is the same angle as the angle between the hours of an analog clock. Lower the implement to the ground.
8. Repeat Step 4 to Step 7. This procedure should be performed 12 times.
9. Install strip (2) and bolts (1).
10. Close the access door.

Swing Gear - Lubricate

SMCS Code: 7063-086

S/N: 6WL1-Up

S/N: 8AL1020-Up

S/N: 6ES229-Up

S/N: 8SS1-Up

S/N: 9PS1-Up

NOTICE

Improper lubrication can cause damage to machine components.

To avoid damage, make sure that the proper amount of grease is applied to the swing drive.

When the amount of grease in the compartment becomes too large, the agitation loss becomes large, thereby accelerating grease deterioration.

Grease deterioration can cause damage to the pinion gear of the swing drive and swing internal gear.

Not enough grease will result in poor gear lubrication.



Illustration 427

g00519844

1. Remove the inspection cover that is located near the boom base. Inspect the grease.

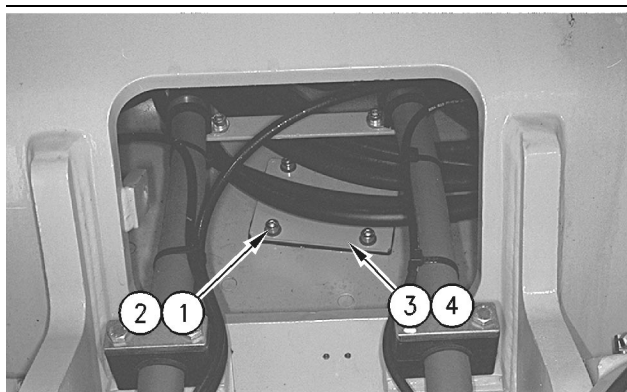


Illustration 428

g00290391

- (1) Bolts
- (2) Bumper springs
- (3) Cover
- (4) Gasket

2. Remove bolts (1) and bumper springs (2). Remove cover (3) and gasket (4).
3. Inspect gasket (4). Replace the gasket if damage is evident.
4. Check the level of grease. The grease should be evenly distributed on the floor of the pan.

Note: Add grease, as needed. Remove grease, as needed. Too much grease will result in the deterioration of the grease because of excessive movement of the grease. Too little grease will result in poor lubrication of the swing gear.

5. Check for contamination and for discolored grease.

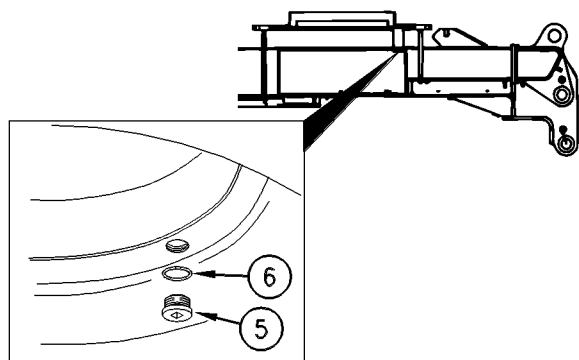


Illustration 429

g00309463

- (5) Plug
- (6) O-ring seal

6. If the grease is contaminated or if the grease is discolored with water, change the grease. Remove plug (5) in order to allow the water to drain. When you reinstall plug (5), inspect the O-ring seal (6). Replace the O-ring seal if damage is evident.
7. Raise the boom. Turn the upper structure by 1/12 of a turn. This is the same angle as the angle between the hours of an analog clock. Lower the implement to the ground.
8. Repeat Step 4 to Step 7 twelve times. Add grease, as needed.
9. Install gasket (4), cover (3), bumper springs (2) and bolts (1).

i00735307

Tire Inflation - Check

SMCS Code: 4203-535-PX; 4203-535-AI

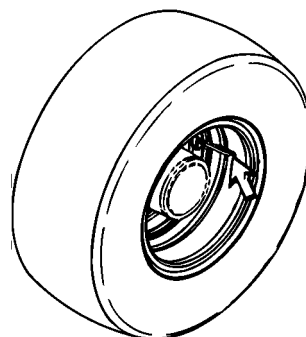


Illustration 430

g00102393

Measure the air pressure on each tire. Consult your Caterpillar dealer for the correct load rating and for the correct operating pressures.

If necessary, inflate the tires. See Operation and Maintenance Manual, "Tire Inflation Information".

i01011331

Transmission Oil - Change

SMCS Code: 3080-044; 3080

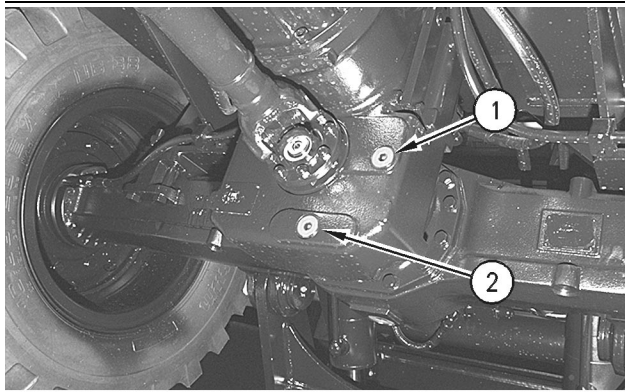


Illustration 431

g00102674

- (1) Filler plug
(2) Drain plug

Operate the machine for an adequate amount of time in order to warm the lubricant.

1. Remove the dirt that is around filler plug (1) and around drain plug (2).
 2. Remove drain plug (2). Drain the lubricant into a suitable container.
- Note:** Dispose of any used lubricants according to local regulations.
3. Clean drain plug (2).
 4. Inspect the O-ring seal. If damage or wear is noticed on the O-ring seal, replace the seal.
 5. Install drain plug (2).
 6. Remove filler plug (1).
 7. Fill the gearbox with lubricant to the bottom of the filler plug opening. See Operation and Maintenance Manual, "Refill Capacities".
 8. Clean filler plug (1).
 9. Inspect the O-ring seal. If damage or wear is noticed on the O-ring seal, replace the seal.
 10. Install filler plug (1).

i01225442

Transmission Oil Level - Check

SMCS Code: 3080

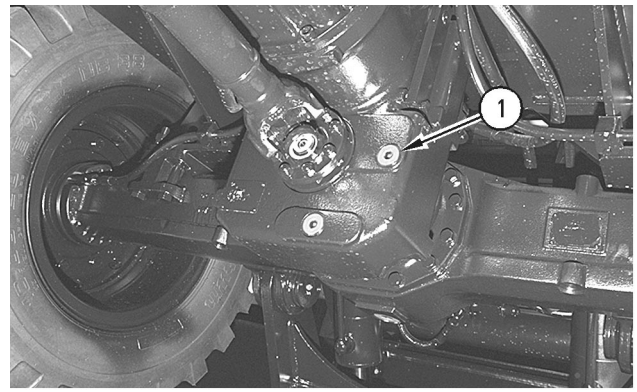


Illustration 432

g00655082

- (1) Filler plug

1. Remove filler plug (1).
2. Check the lubricant level. The lubricant level should be at the bottom of the opening for filler plug (1).
3. If necessary, fill the gearbox with lubricant to the bottom of the opening for filler plug (1).
4. Clean filler plug (1).
5. Inspect the O-ring seal. If damage or wear is noticed on the O-ring seal, replace the seal.
6. Install filler plug (1).

i00700594

Travel Alarm - Test (If Equipped)

SMCS Code: 7429-081



Illustration 433

g00102374

1. Turn the engine start switch key to the ON position in order to perform the test.

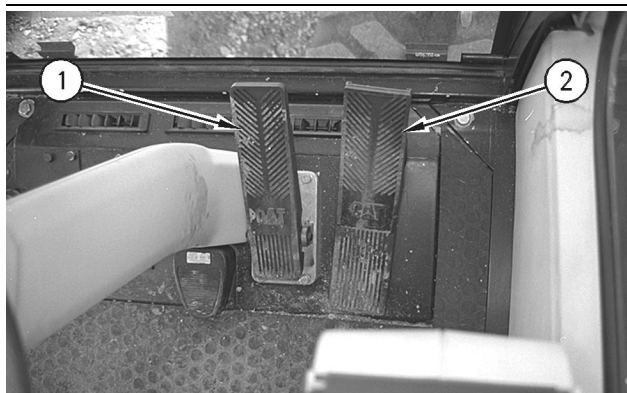


Illustration 434

g00102376

- (1) Service brake
- (2) Travel speed pedal

2. Apply service brake (1). Depress travel speed pedal (2) for forward travel or for reverse travel.



Illustration 435

g00102377

- (3) Travel alarm cancel switch

The travel alarm should sound immediately. The alarm will sound until the travel speed pedal is released or until travel alarm cancel switch (3) is depressed. The travel alarm will sound for a minimum of 10 ± 4 seconds.

V-Belts - Inspect/Adjust/Replace

SMCS Code: 1357-025; 1357-040; 1357-510; 1359-025; 1359-040; 1359-510; 1361-025; 1361-040; 1361-510; 1405-025; 1405-040; 1405-510; 7320-025; 7320-040; 7320-510

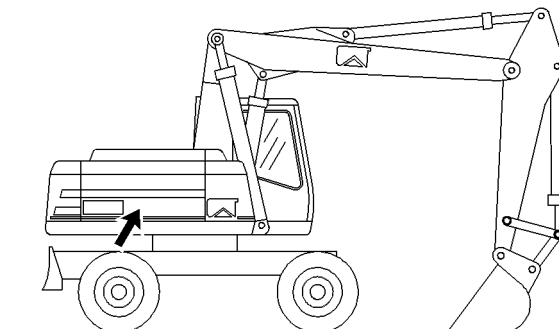


Illustration 436

g00290071

All drive belts except the air conditioner belt (if equipped) are behind the access cover on the right side of the machine. The air conditioner belt (if equipped) is located in the engine compartment.

Your engine can be equipped with a water pump belt, a fan drive belt, accessory drive belts, and an alternator belt. For maximum engine performance and maximum utilization of your engine, inspect the belts for wear and for cracking. Check the belt tension. Adjust the belt tension in order to minimize belt slippage. Belt slippage will decrease the belt life. Belt slippage will also cause poor performance of the alternator and of any driven equipment.

If new belts are installed, recheck the belt adjustment after 30 minutes of operation. If two belts or more are required for an application, replace the belts in belt sets. If only one belt of a matched set is replaced, the new belt will carry more load. This is due to the fact that the older belts are stretched. The additional load on the new belt could cause the new belt to break.

Water Pump Belt

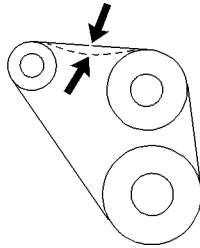


Illustration 437

g00328628

1. To check the belt tension, apply 110 N (25 lb) of force midway between the pulleys. Correctly adjusted belts will deflect 13 to 19 mm (1/2 to 3/4 inch).

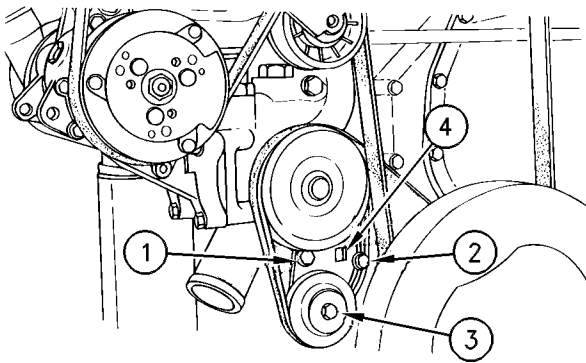


Illustration 438

g00102478

This is a typical example of the water pump belt.

- (1) Mounting bolt
 - (2) Bracket bolt
 - (3) Idler pulley
 - (4) Square hold in mounting bracket
2. To adjust the water pump drive belt, loosen mounting bolt (1) and bracket bolt (2).
 3. Move idler pulley (3) in order to achieve the correct adjustment.
 4. If necessary, use a pry bar in square hole (4) in the mounting bracket.
 5. Tighten bracket bolt (2) and mounting bolt (1).
 6. If a new belt is installed, run the engine at rated speed for 30 minutes. Check the bolt torque. Readjust the belt, if necessary.

Alternator Belt and Fan Belt

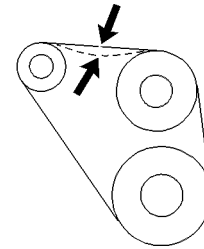


Illustration 439

g00328628

1. To check the belt tension, apply 110 N (25 lb) of force midway between the pulleys. Correctly adjusted belts will deflect 13 to 19 mm (1/2 to 3/4 inch).

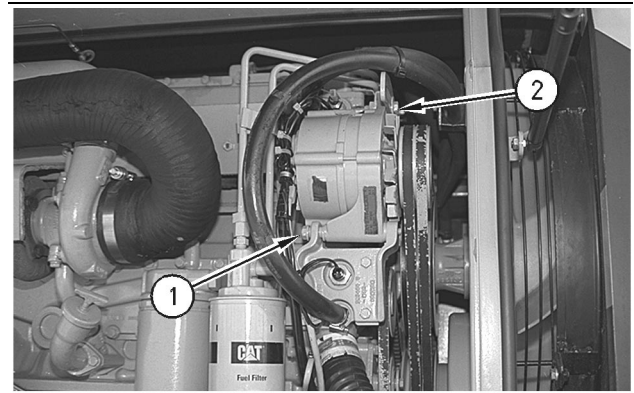


Illustration 440

g00102479

- (1) Mounting bolt
- (2) Bracket bolt

2. To adjust the alternator belt or the fan belt, loosen mounting bolt (1) and bracket bolt (2).
3. Move the alternator in order to attain the correct adjustment.
4. Tighten bolt (2). Tighten bolt (1) to 50 ± 5 N·m (37 ± 4 lb ft).

Air Conditioner Belt (If Equipped)

NOTICE

An incorrectly tensioned V-belt could cause not only a decrease of the compressor performance but damage to the belt and compressor.

1. Apply approximately 98 N (22 lb) force midway between the pulleys.

2. Measure the deflection of the belt. The belt should deflect 7 to 10 mm (5/16 to 7/16 inch).

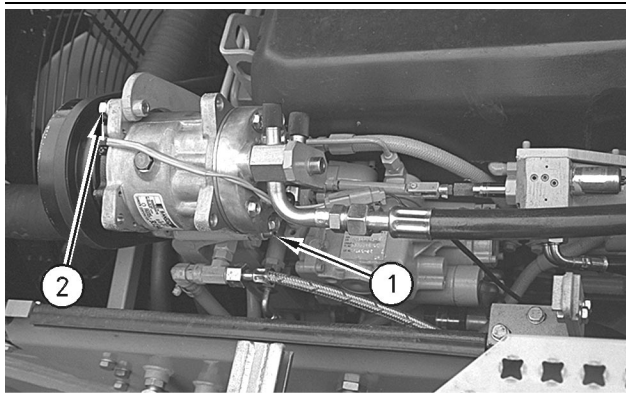


Illustration 441

g00102480

- (1) Mounting bolt
(2) Mounting bracket

3. If the deflection is not correct, loosen mounting bolt (1) and bracket bolt (2). Move the compressor in order to attain the correct adjustment.
4. Tighten bracket bolt (2) and mounting bolt (1).

i00995282

Walk-Around Inspection

SMCS Code: 7000

NOTICE

Accumulated grease and oil on a machine is a fire hazard. Remove this debris with steam cleaning or high pressure water, at least every 1000 hours or each time any significant quantity of oil is spilled on a machine.

NOTICE

Spray cleaning the machine with the engine access cover open and engine running could result in engine damage.

To avoid engine damage, always shut the engine down and cover the engine air inlet opening before spray cleaning with the hood open.

Note: Watch closely for leaks. If you observe a leak, find the source of the leak and correct the leak. If you suspect a leak or you observe a leak, check the fluid levels more frequently. Refer to Operation and Maintenance Manual, "Maintenance Interval Schedule" for the correct intervals.

Check the implement cylinders and the linkage. Repair these components if these components are damaged or excessively worn.

Inspect the lights for broken bulbs and for broken lenses. Replace any broken bulbs or broken lenses.

Inspect the engine compartment. Remove any trash buildup that is in the engine compartment.

Inspect the cooling system for leaks, for faulty hoses, and for any trash buildup. Correct any leaks and remove any trash from the radiator.

Inspect all belts. Replace any belts if the following conditions exist:

- The belts are worn.
- The belts are cracked.
- The edges of the belts are frayed.

Inspect the hydraulic system for leaks. Inspect the following components. Repair all leaks.

- Tank
- Cylinder rod seals
- Hoses
- Tubes
- Plugs
- Assembled joints
- Fittings

Inspect the swing drive. Repair all leaks.

Inspect the steering axle, the axle hubs, and the axle gearbox. Correct any leaks.

Inspect the wheel brakes for oil leaks. Repair any leaks.

Inspect the transmission for leaks. Correct any leaks.

Inspect all tires for damage and for proper inflation. Replace any missing valve caps.

Inspect the covers for damage and the guards for damage. Also make sure that these components are securely attached.

Inspect the following components for condition and for cleanliness. Repair the components or clean the components, as needed.

- Steps
- Walkways

- Handholds

Inspect the Falling Objects Protective Structure (if equipped) for damage. Tighten any loose bolts. Make any necessary repairs.

Inspect the operator's compartment for cleanliness. Keep the operator's compartment clean.

Adjust the rearview mirrors for best visibility.

i00124062

Wheel Nut Torque - Check

SMCS Code: 4210-535

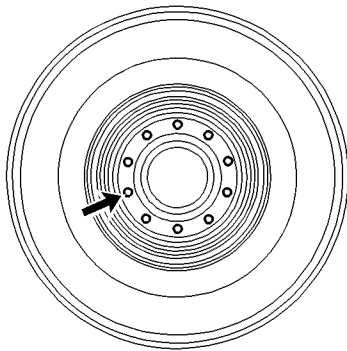


Illustration 442

g00102965

Check the torque on the ten wheel nuts on each of the four wheels. The torque needs to be 350 to 400 N·m (260 to 300 lb ft). If necessary, tighten the wheel nuts.

i01077829

Windows - Clean

SMCS Code: 7310-070; 7340-070

Use commercially available window cleaning solutions in order to clean the windows. Clean the outside of the windows from the ground, unless handholds are available.

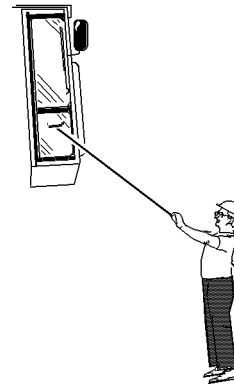


Illustration 443

g00566124

Typical example

Use a pole with a squeegee in order to reach the high areas of the window.

Cleaning Methods

Aircraft Windshield Cleaner

Apply the cleaner with a soft cloth. Rub the window with moderate pressure until all the dirt is removed. Allow the cleaner to dry. Wipe off the cleaner with a clean soft cloth.

Soap and Water

Use a clean sponge or a soft cloth. Wash the windows with a mild soap or with a mild detergent. Also use plenty of lukewarm water. Rinse the windows thoroughly. Dry the windows with a moist chamois or with a moist cellulose sponge.

Stubborn Dirt and Grease

Wash the windows with a good grade of naphtha, of isopropyl alcohol, or of Butyl Cellosolve. Then, wash the windows with soap and with water.

i01220995

Window Washer Reservoir - Fill

SMCS Code: 7306-544-KE

NOTICE

When operating in freezing temperatures, use Caterpillar or any commercially available nonfreezing window washer solvent.

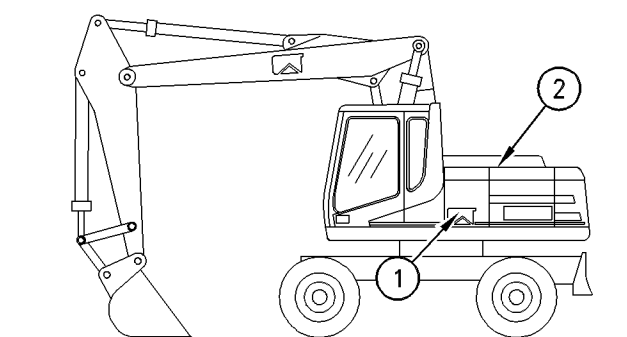


Illustration 444

g00290119

- (1) Access door
(2) Top access cover

1. Open and secure access door (1) on the left side of the machine.
2. Open top access cover (2).

WARNING

Bodily injury can occur from unexpected contact with open cab doors on machines equipped with a fixed cab riser.

To avoid injury, close the cab door before climbing onto the rear of the machine.

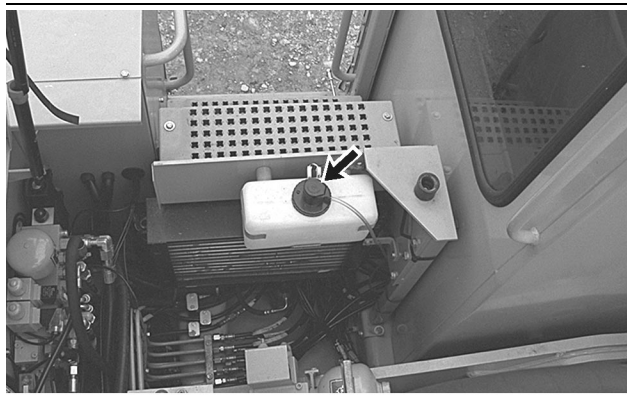


Illustration 445

g00102266

3. Fill the fluid reservoir through the filler opening on the top of the reservoir. If the machine is equipped with a lower window wiper/washer, a second fluid reservoir is mounted in this area. Fill the second fluid reservoir through the filler opening on the top of the fluid reservoir.
4. Close top access cover (2) and access door (1).

Window Wiper - Inspect/Replace

SMCS Code: 7305-040; 7305-510

Inspect the window wiper blades. Replace the wiper blades if the wiper blades are worn or damaged. Also replace the wiper blades if the wiper blades cause streaks.